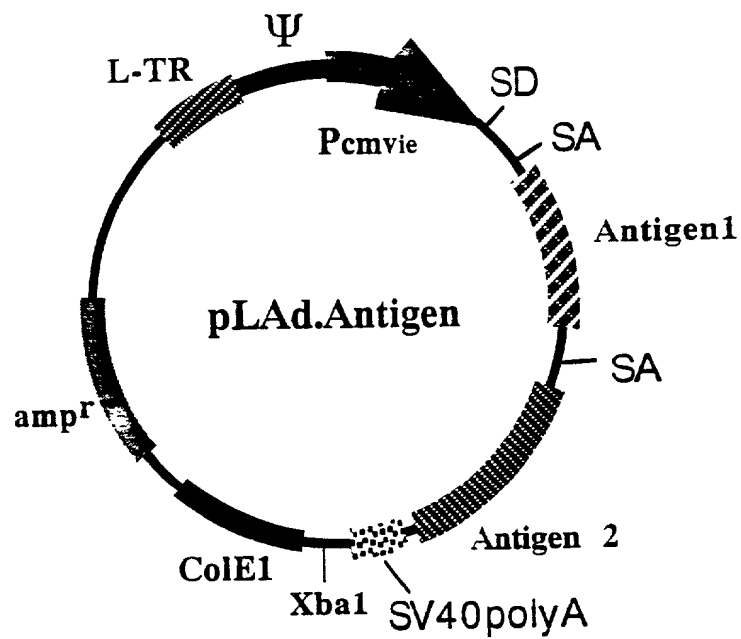
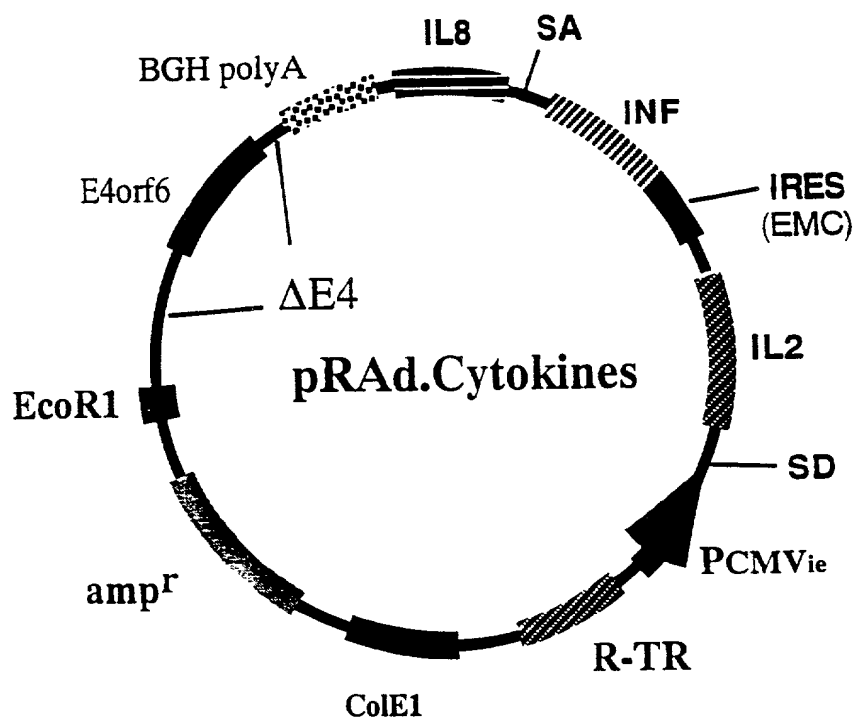


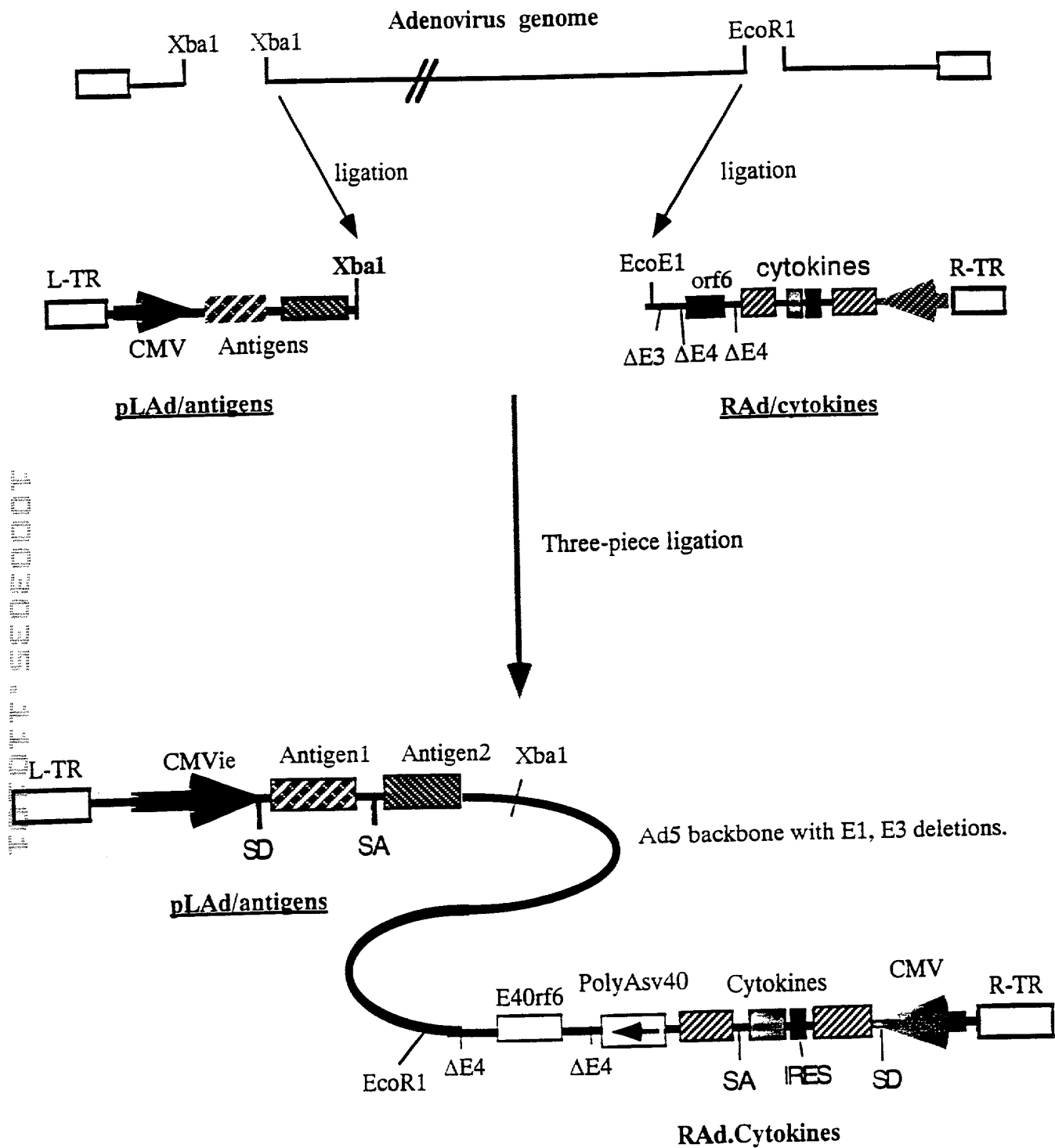
**FIGURE 1A**



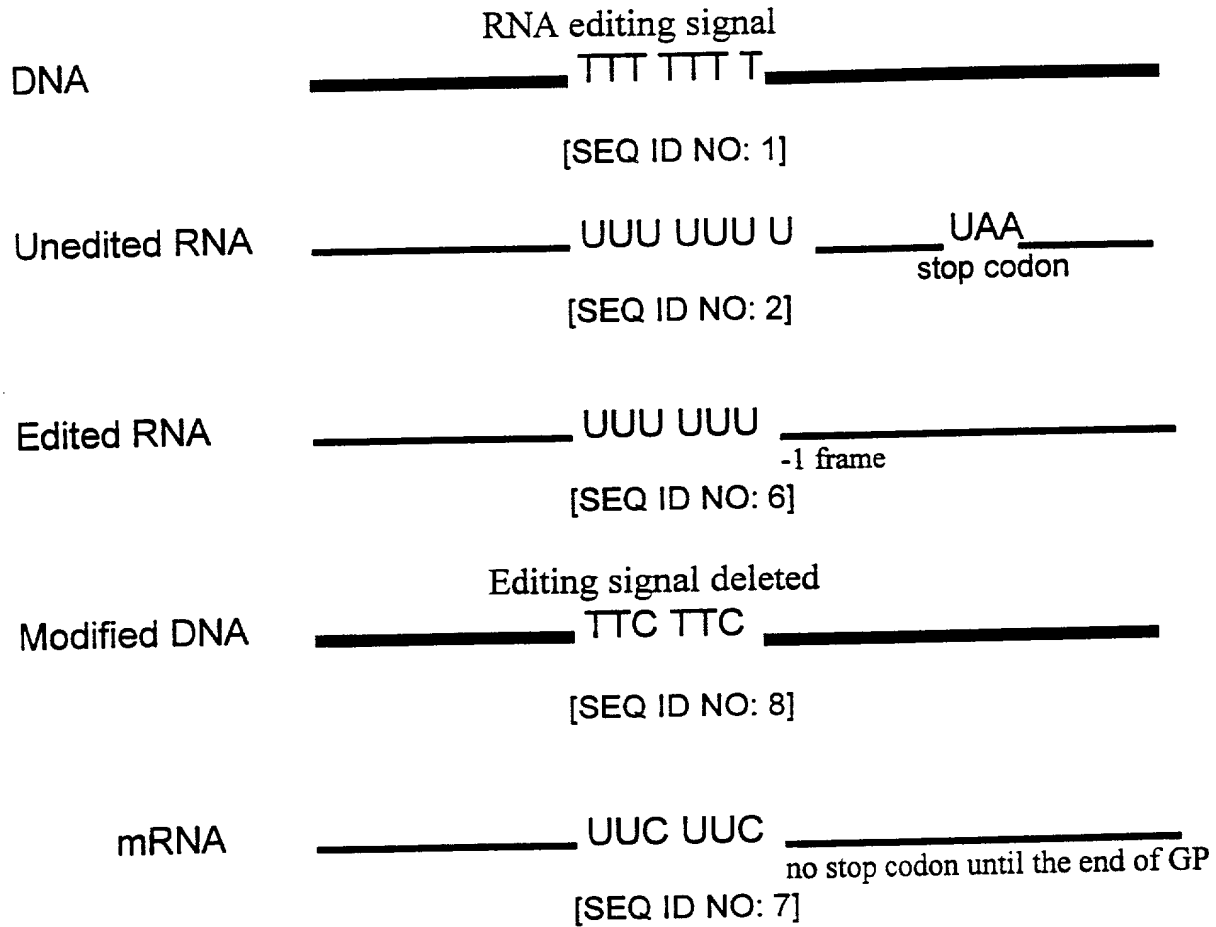
**FIGURE 1B**

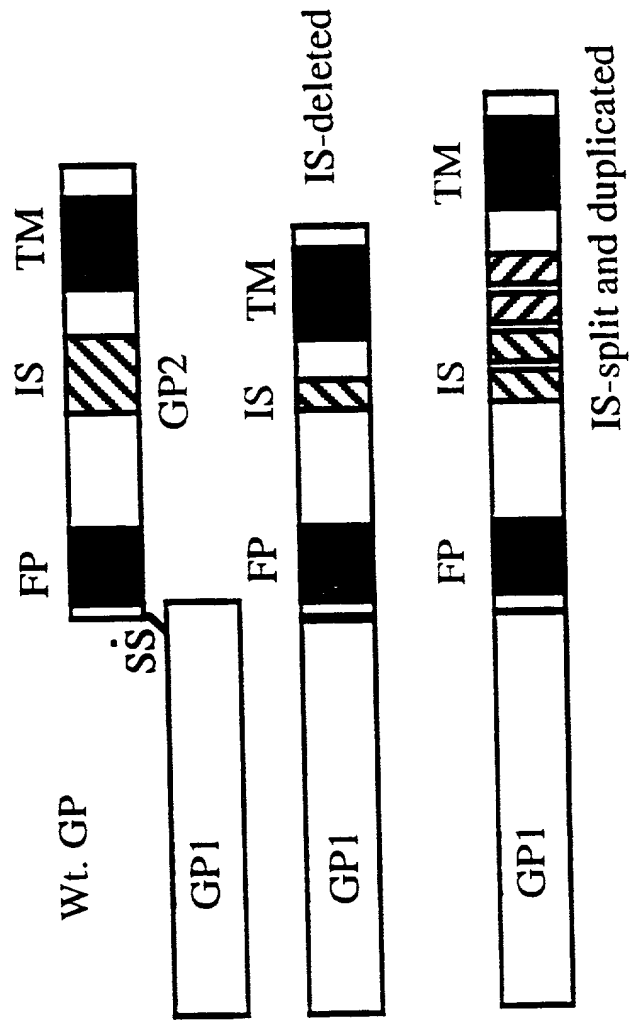


**FIGURE 1C**



**FIGURE 2**



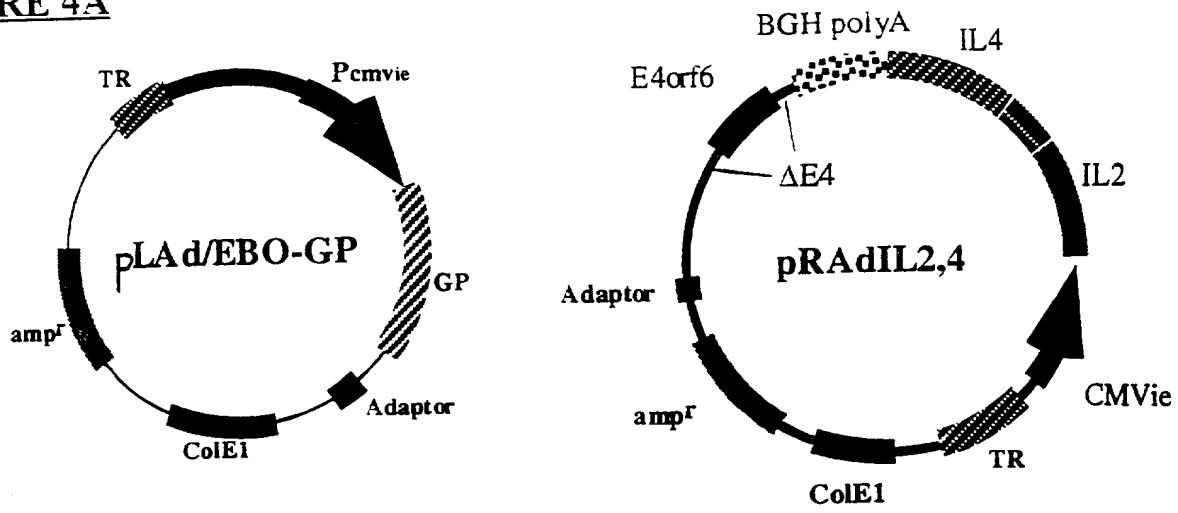


**FIGURE 3A**

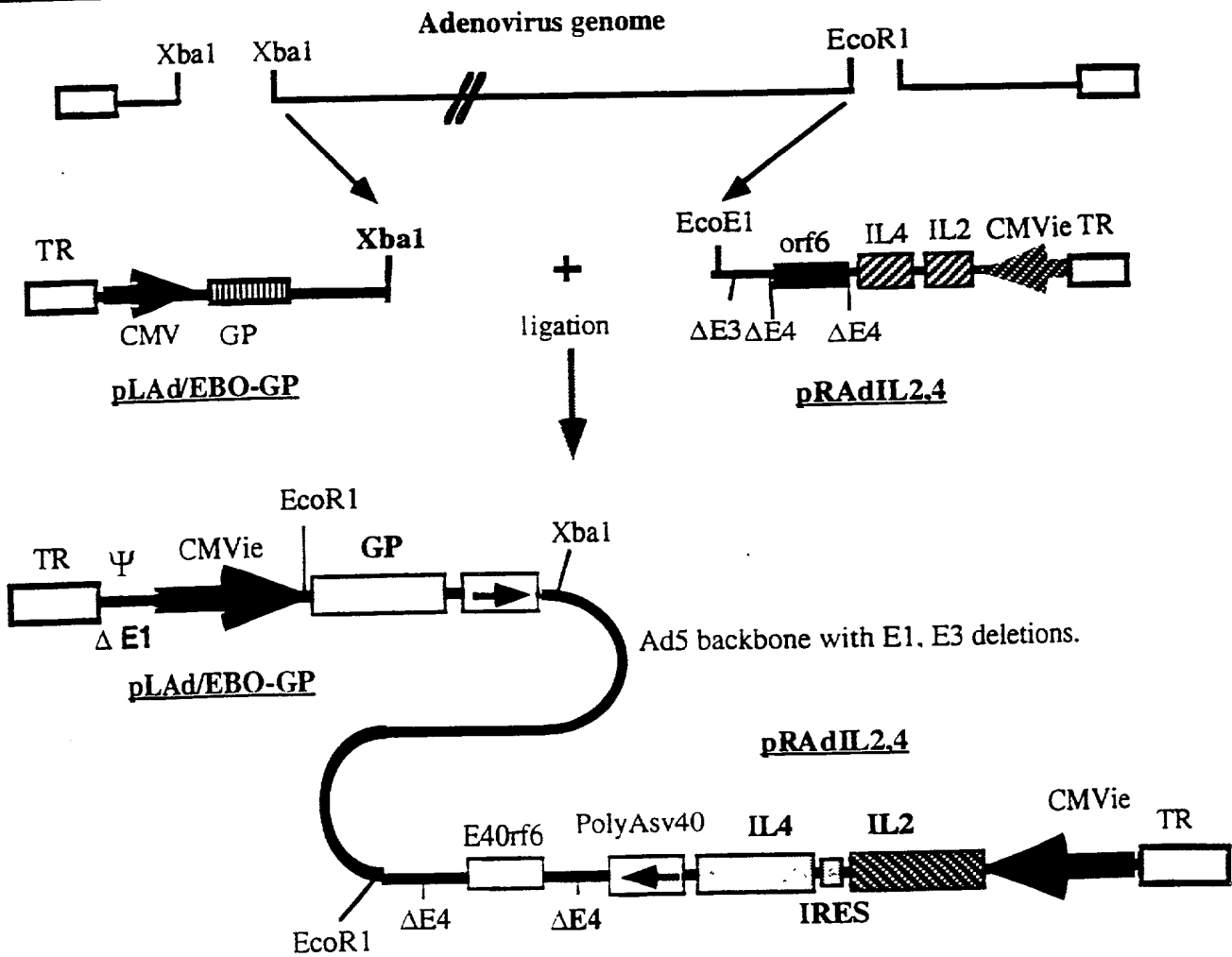
**FIGURE 3B**

**FIGURE 3C**

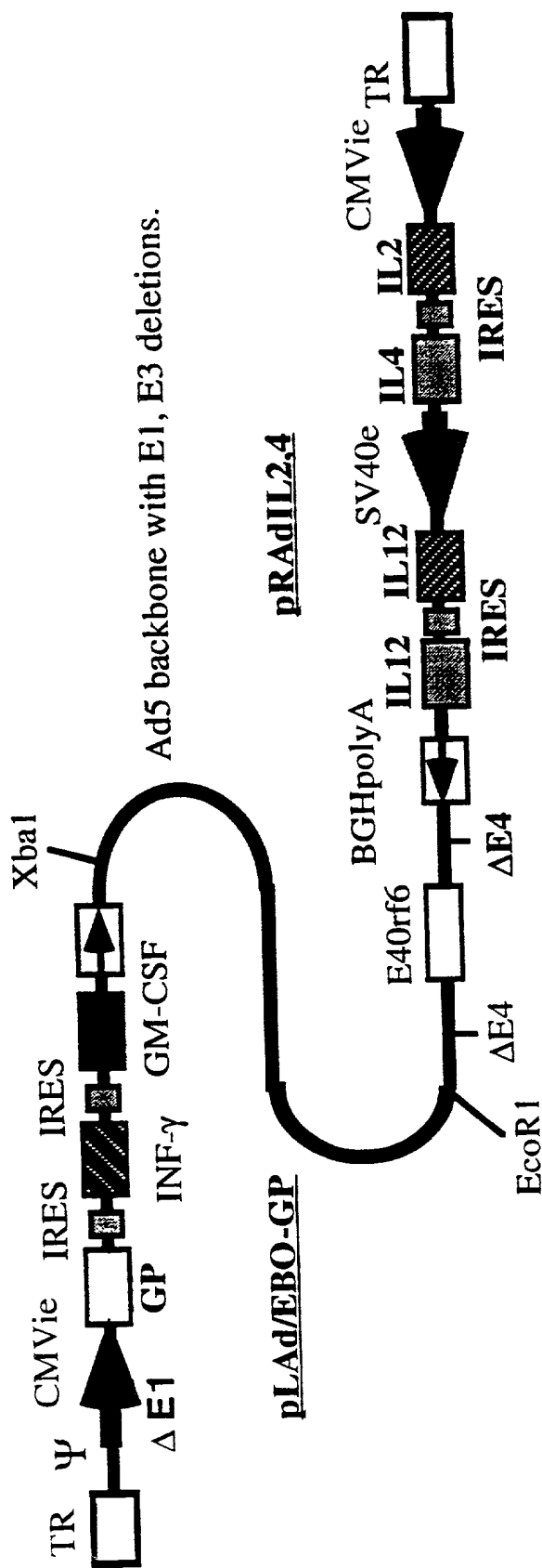
**FIGURE 4A**



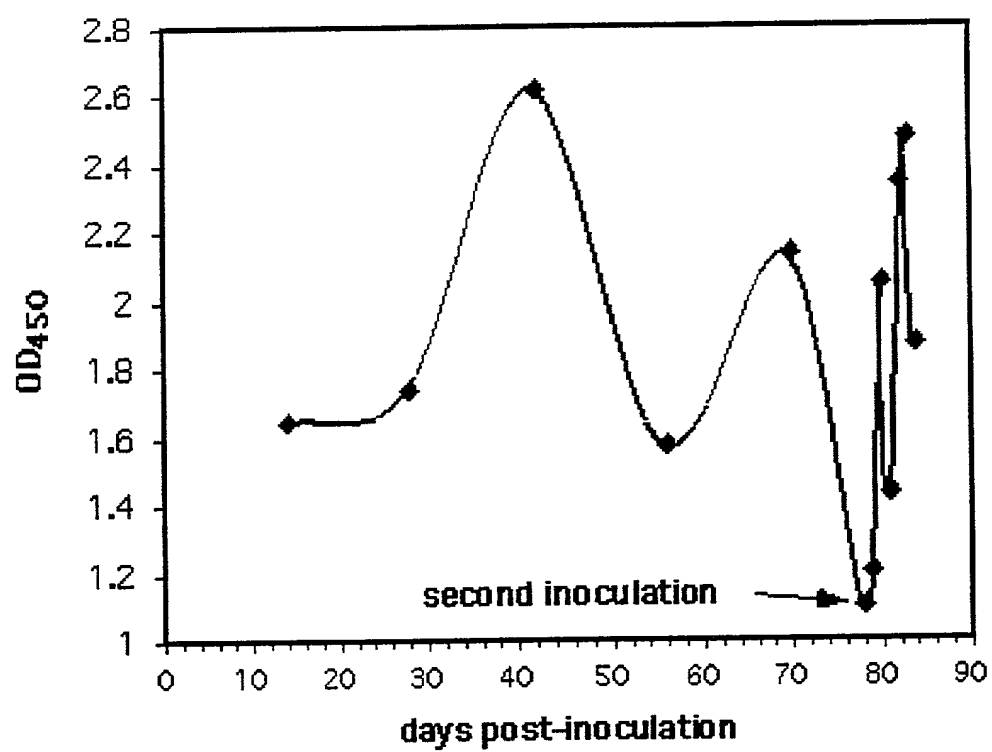
**FIGURE 4B**



**FIGURE 5**

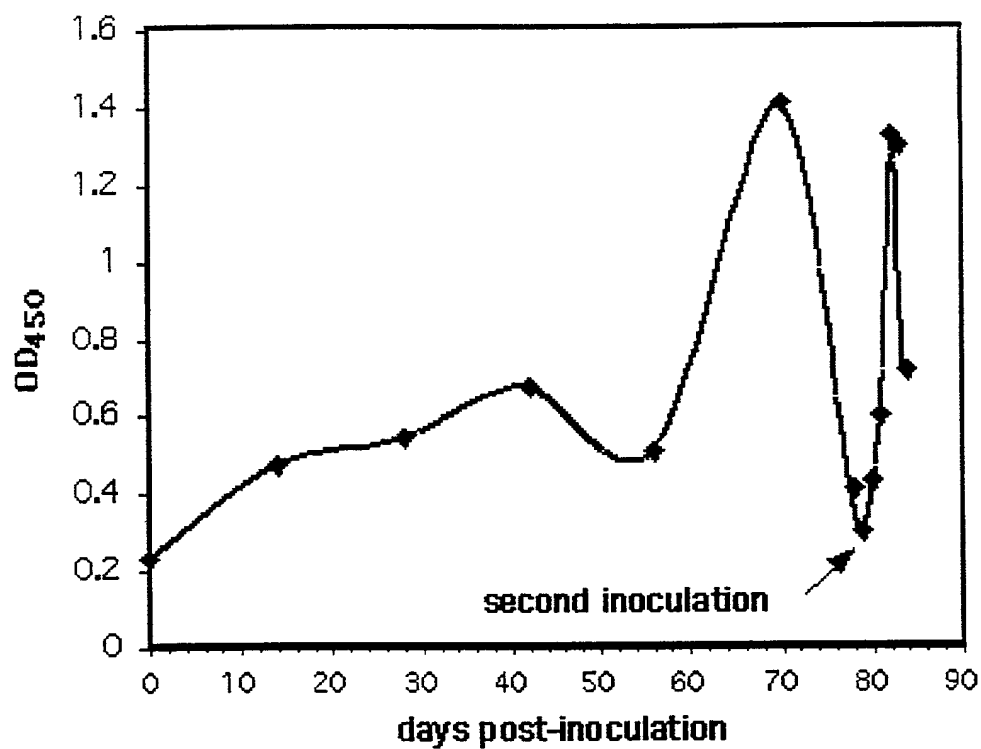


Anti-HIV (tat,env) relative titer  
(Group 3)



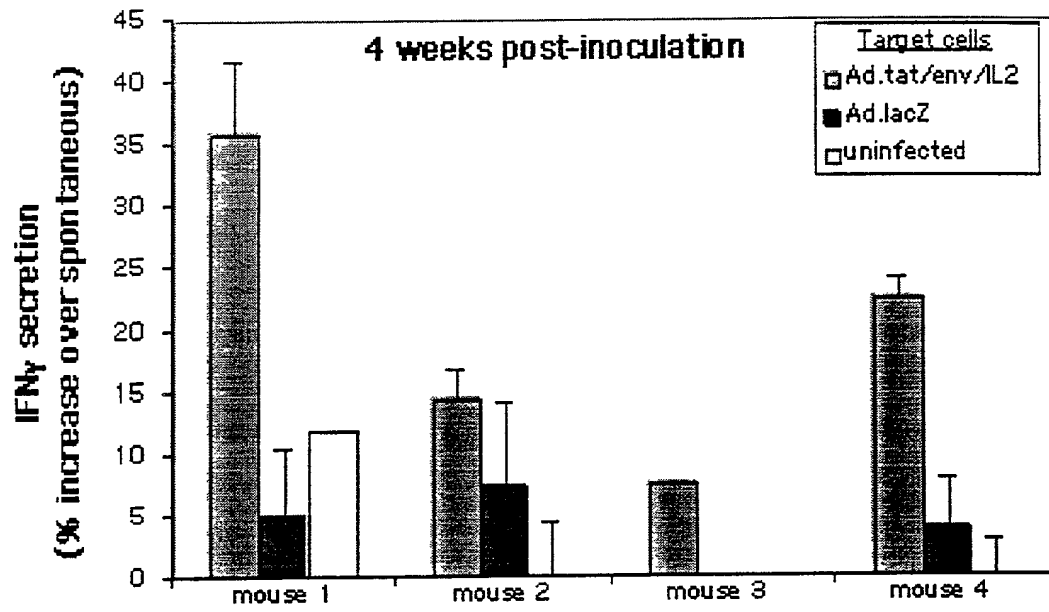
**FIGURE 6**

Anti-HIV (tat,env) relative titer  
(Group 4)



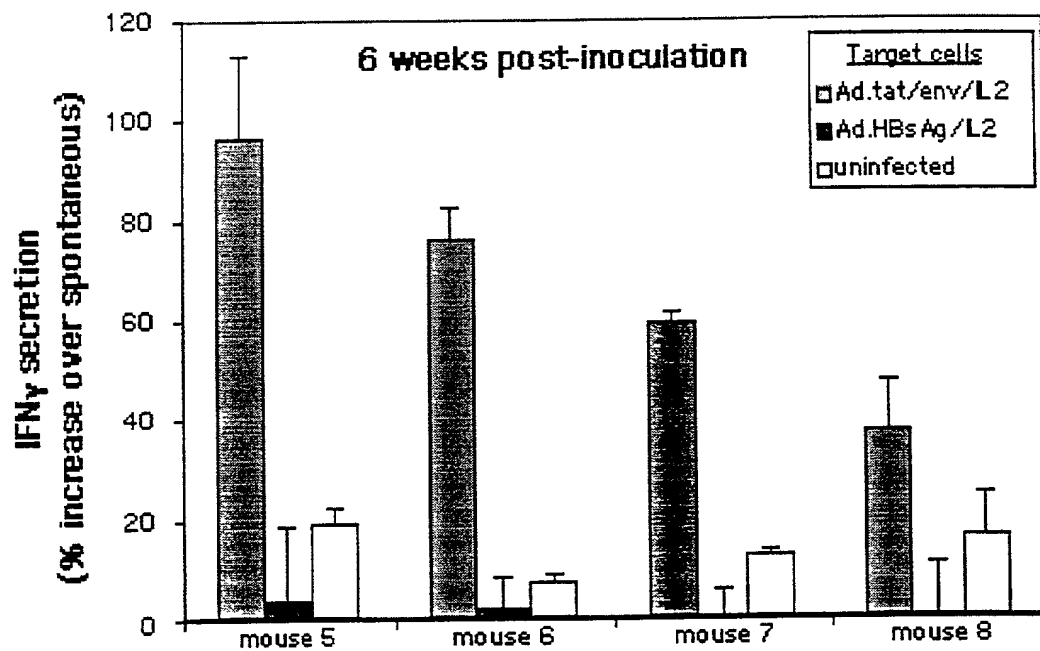
**FIGURE 7**

IFN $\gamma$  secretion from activated splenocytes in response to target  
cell stimulation



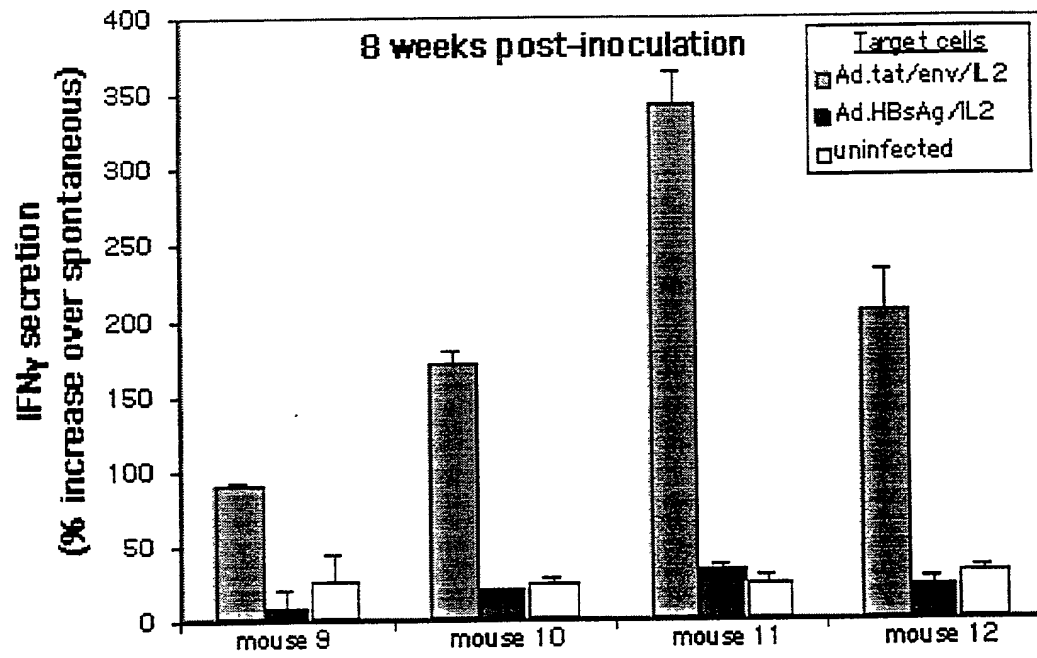
**FIGURE 8A**

IFN $\gamma$  secretion from activated splenocytes in response to target cell stimulation



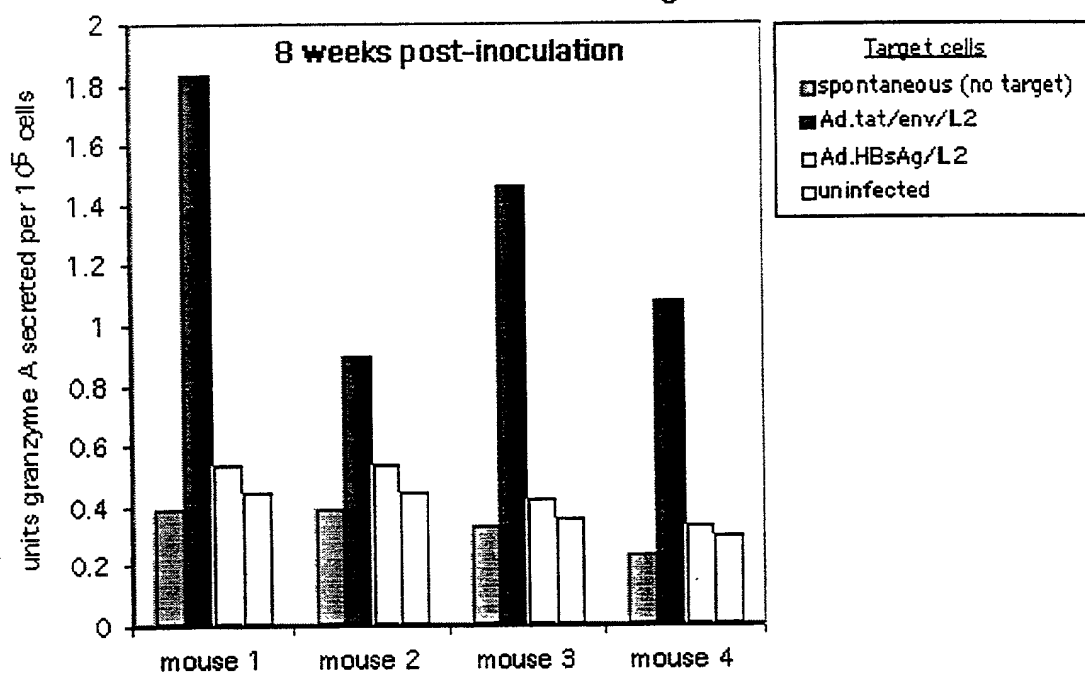
**FIGURE 8B**

IFN $\gamma$  secretion from activated splenocytes in response to target  
cell stimulation



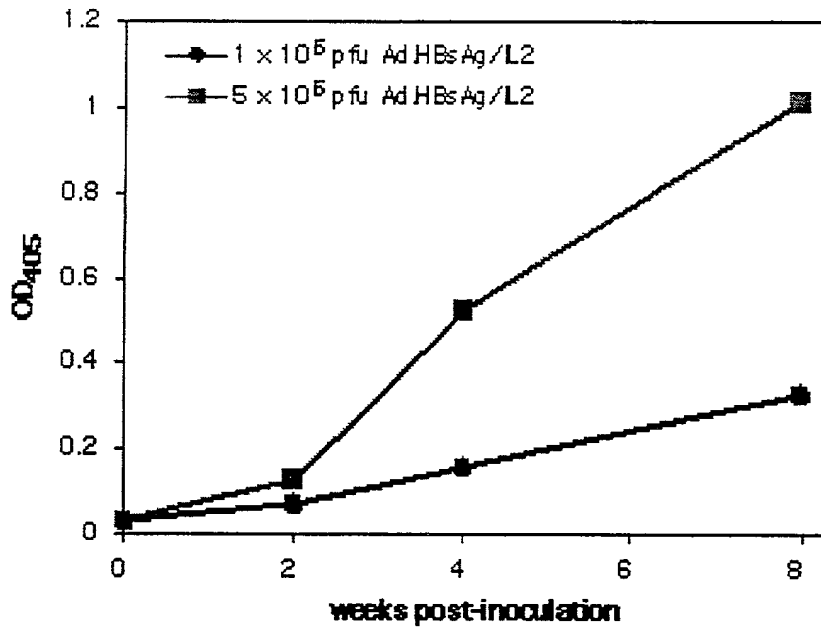
**FIGURE 8C**

# Granzyme A secretion from activated splenocytes in response to stimulation with target cells



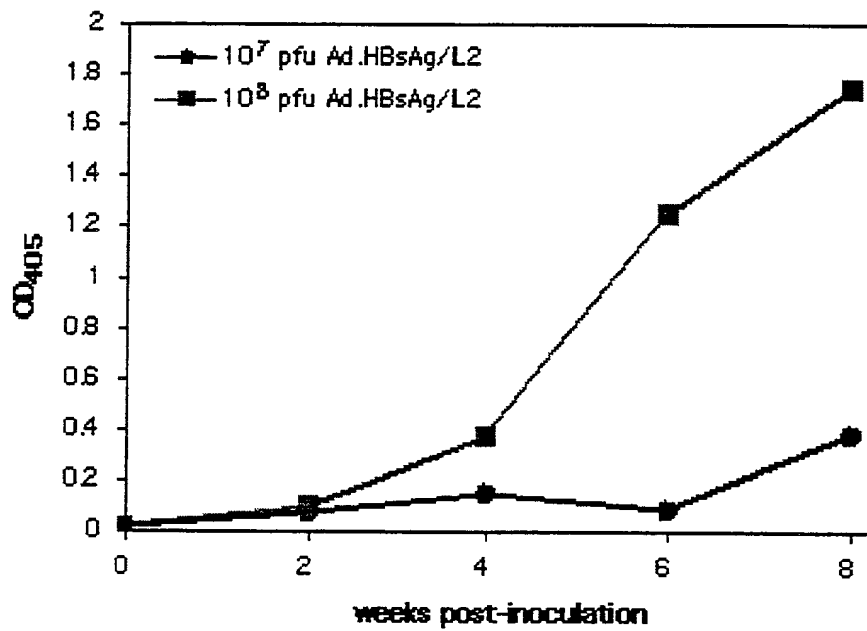
**FIGURE 9**

Anti-HBsAg relative titer  
(Group 1)



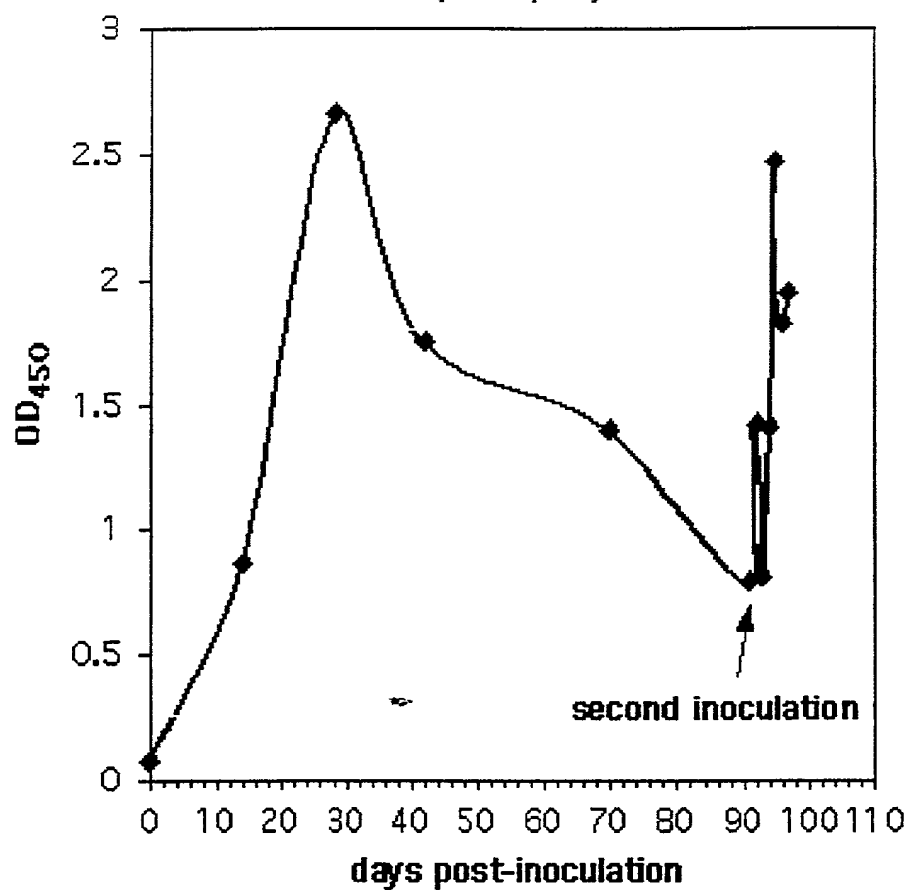
**FIGURE 10A**

Anti-HBsAg relative titer  
(Group 2)



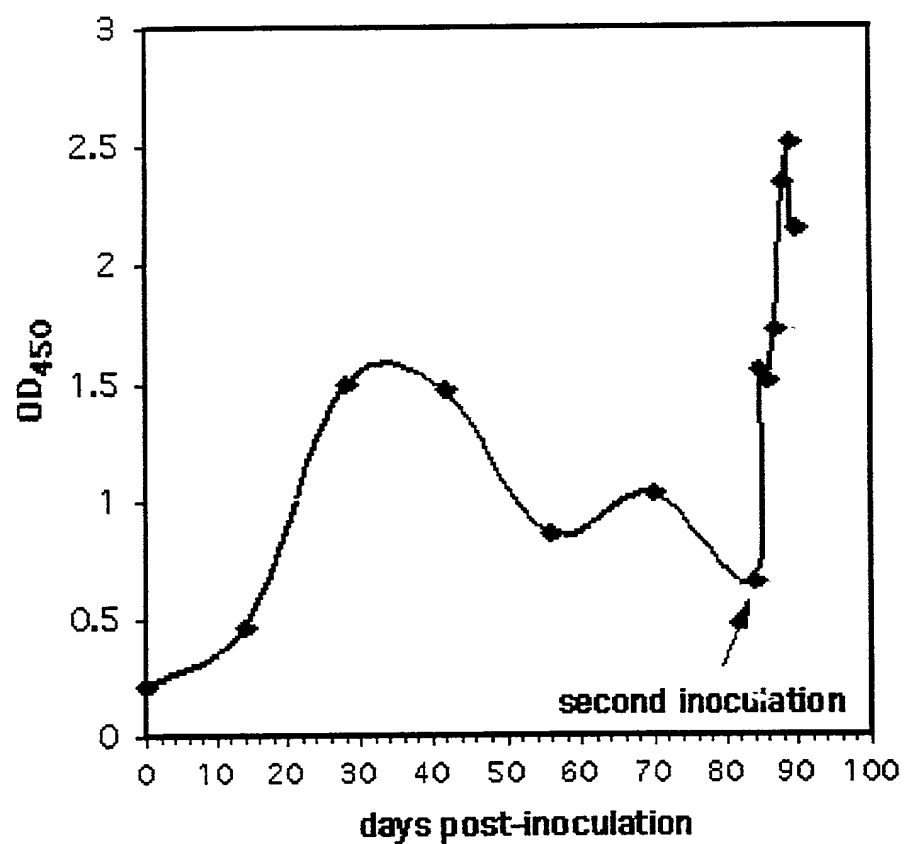
**FIGURE 10B**

Anti-HBcAg relative titer  
(Group 3)



**FIGURE 11A**

Anti-HBcAg relative titer  
(Group 4)



**FIGURE 11B**

FIGURE 12

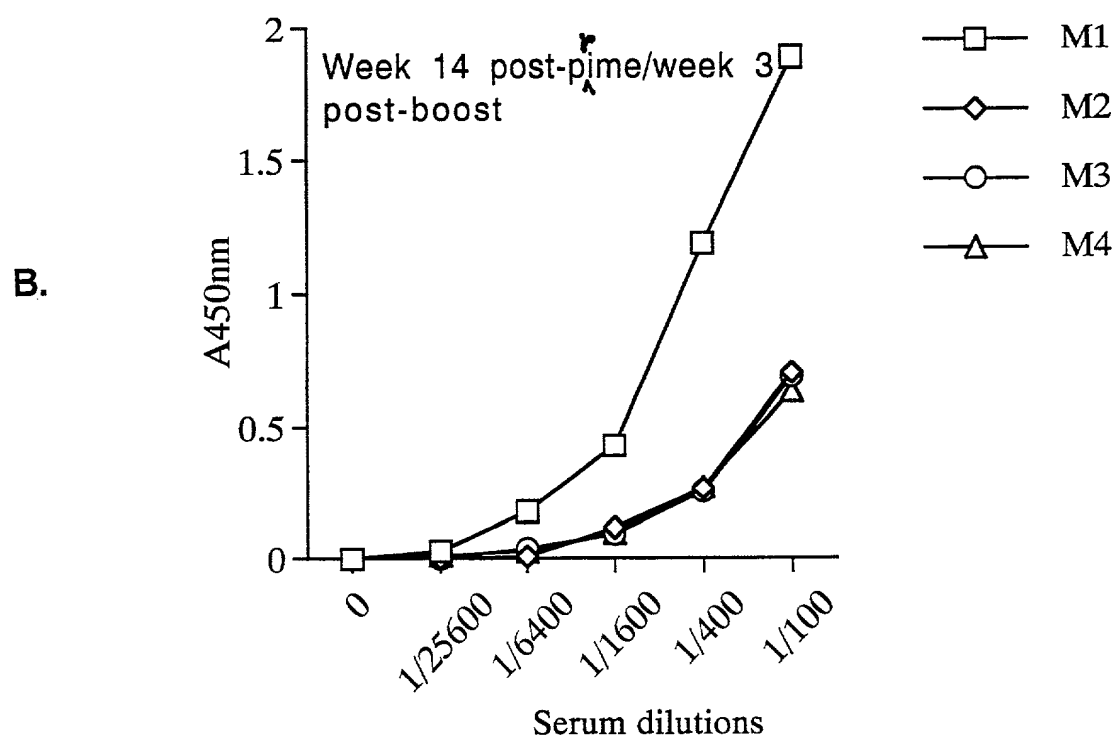
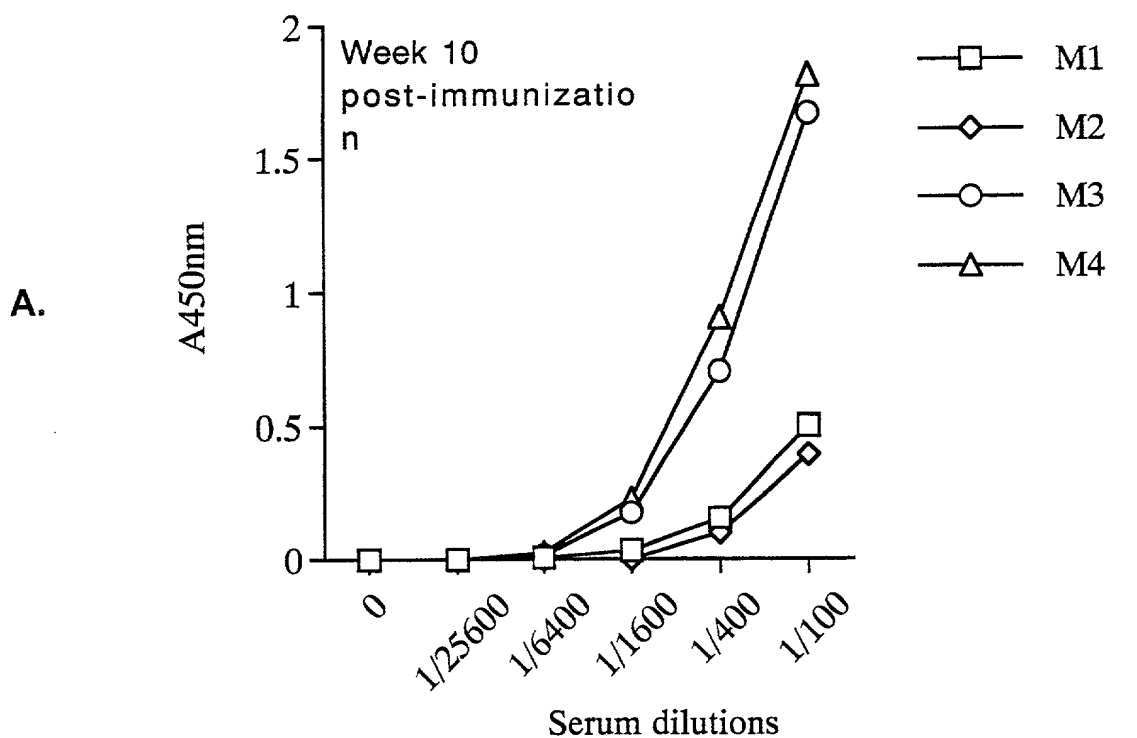
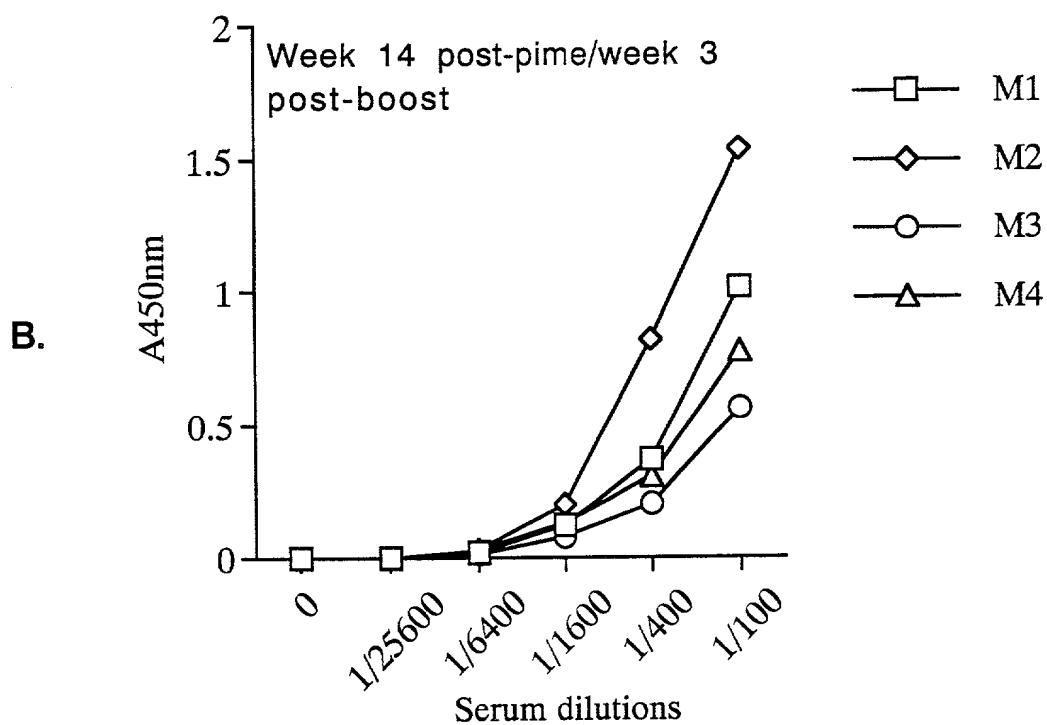
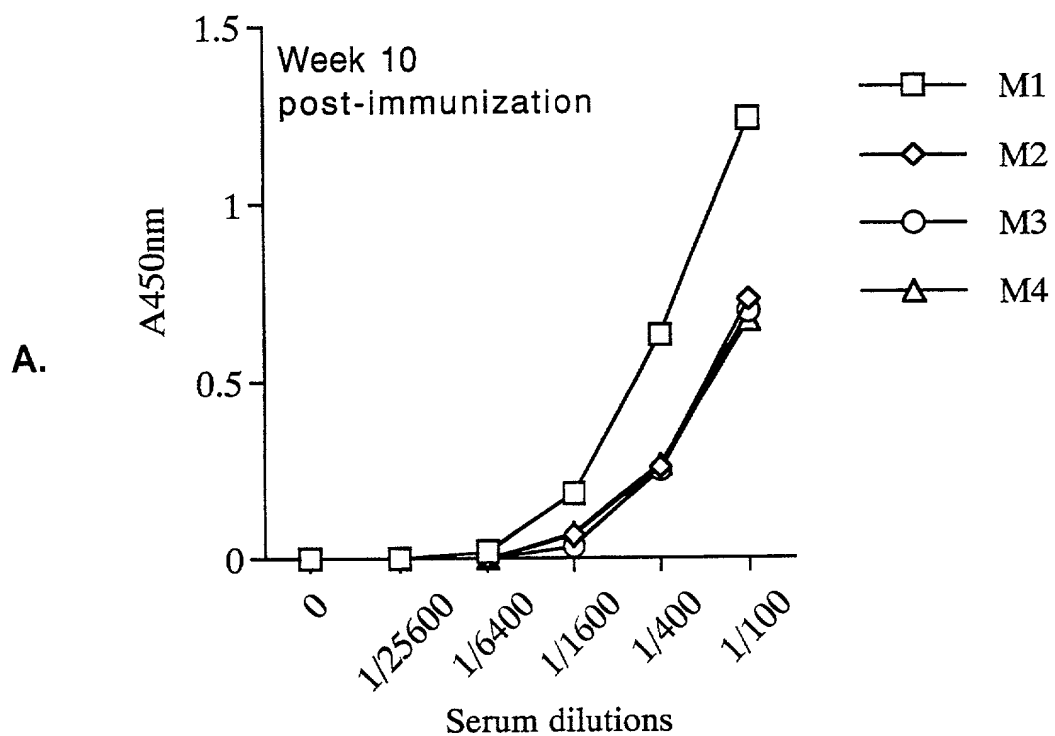


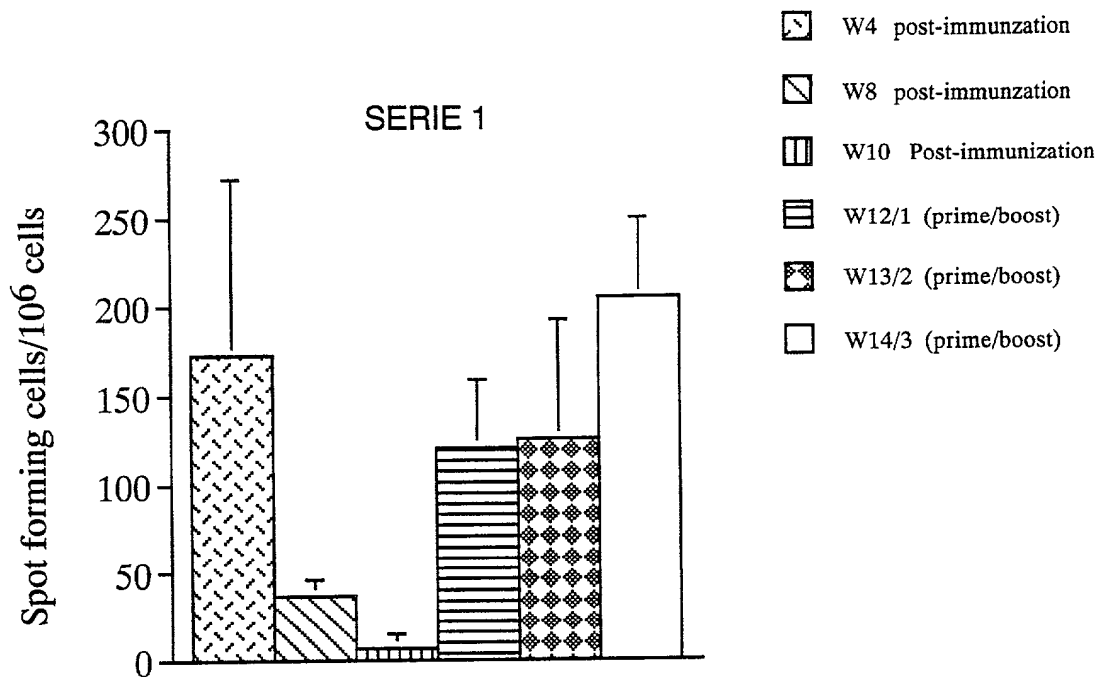
FIGURE 13



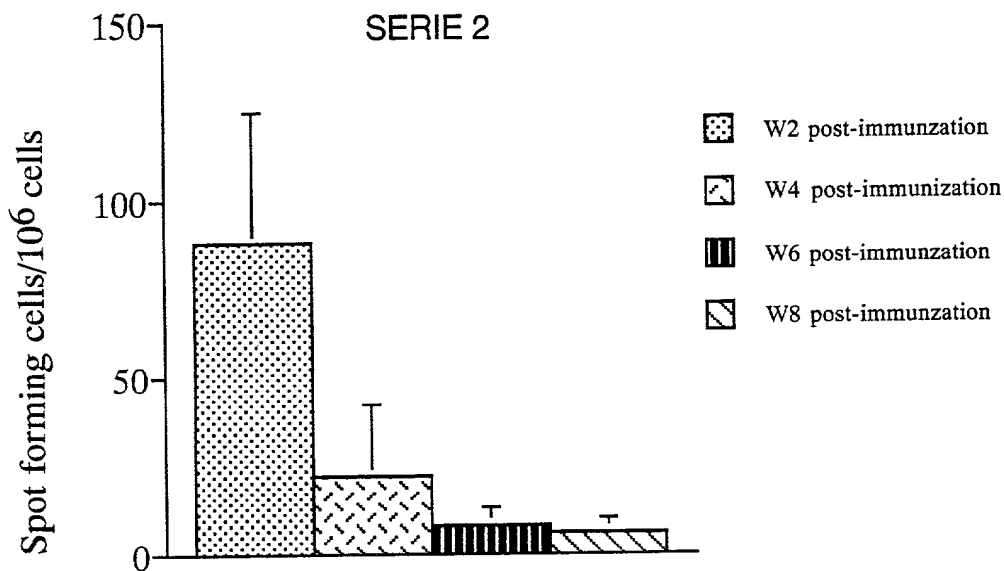
**FIGURE 14**

Gag-specific IFN $\gamma$  secreting splenic cells  
after immunization of mice with Ad(3C,  
Gag, Env)

**A.**

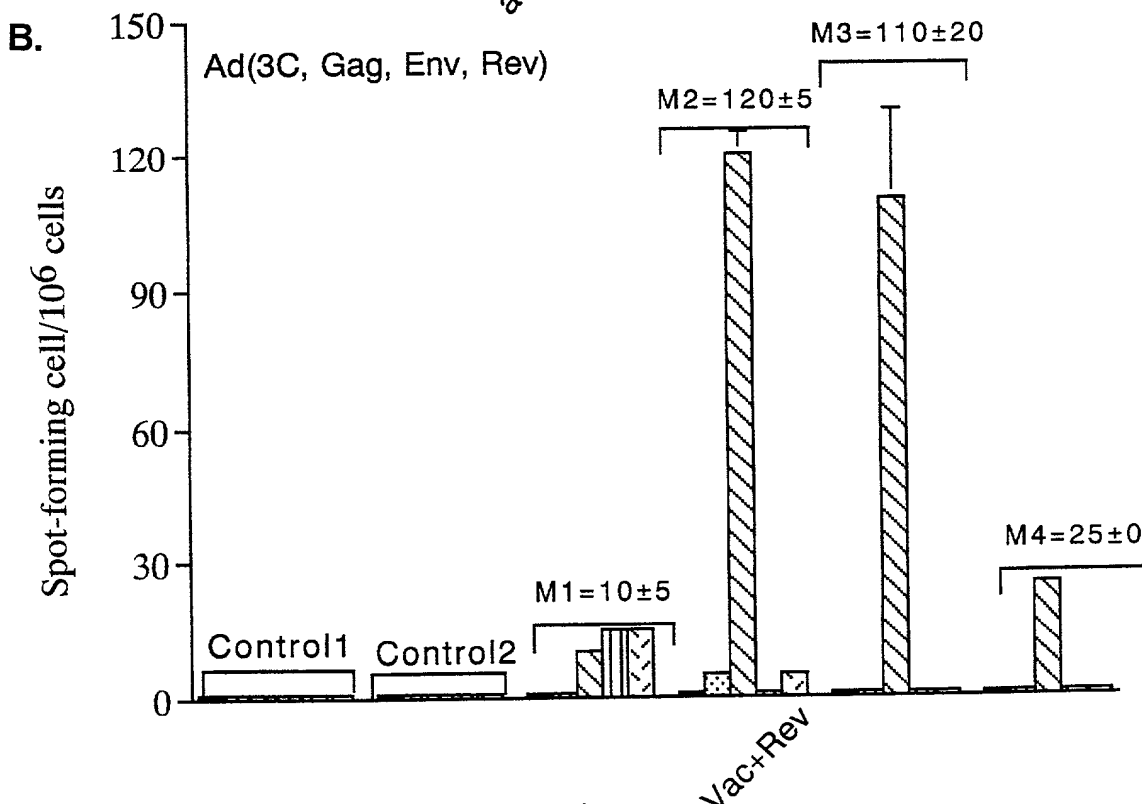
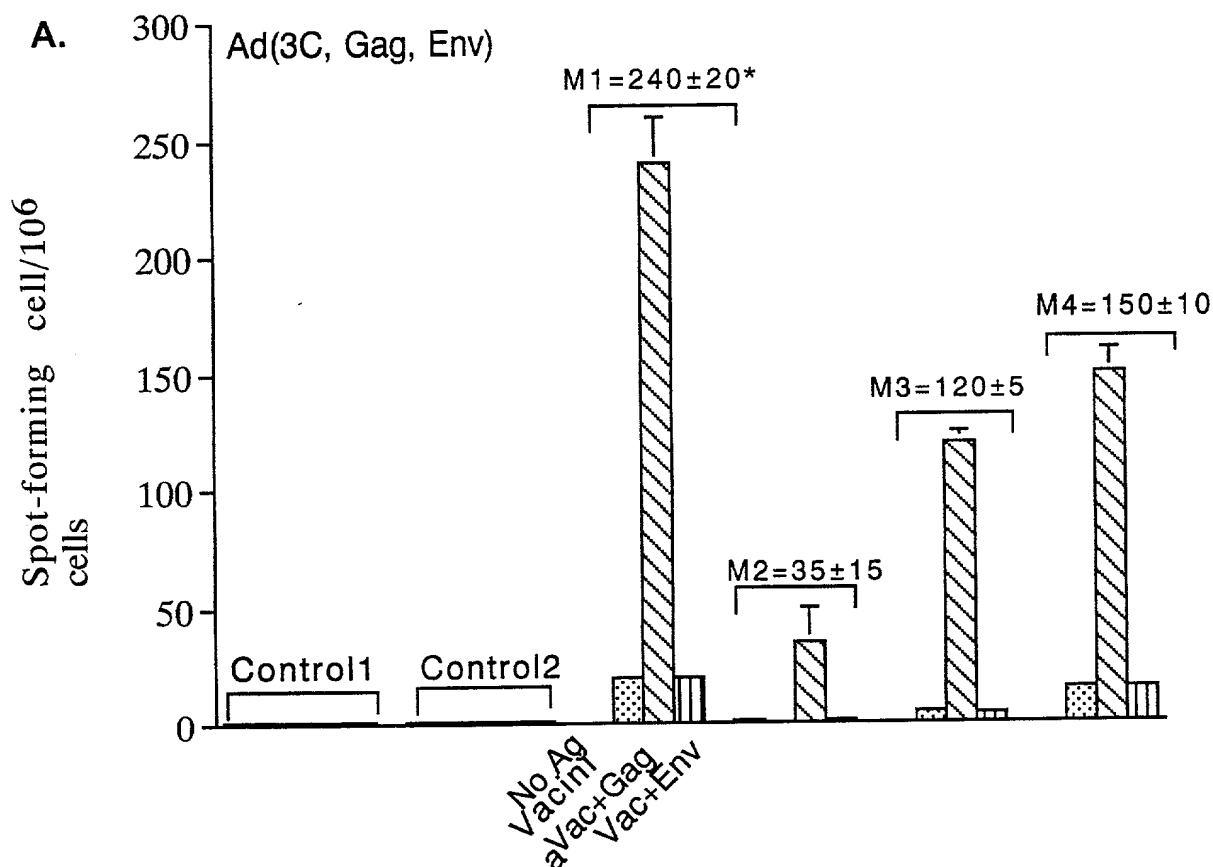


**B.**



**FIGURE 15**

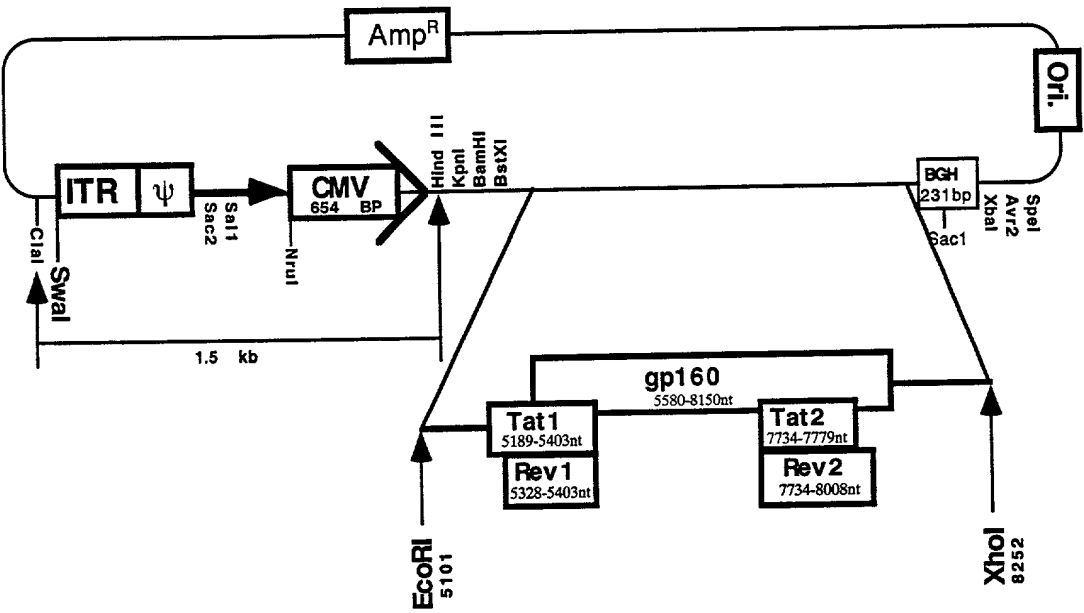
L23: ELISPOT for IFN $\gamma$  secretion: Serie1 spleen cells  
from mice at week W13/2 (post-prime/boost)



\* Gag-specific IFN $\gamma$  secreting

FIGURE 16 Ad-E.T.R/IL2 (from BH10 strain)

A. pLAd-E.T.R



B. pRAd.ORF6-IL2

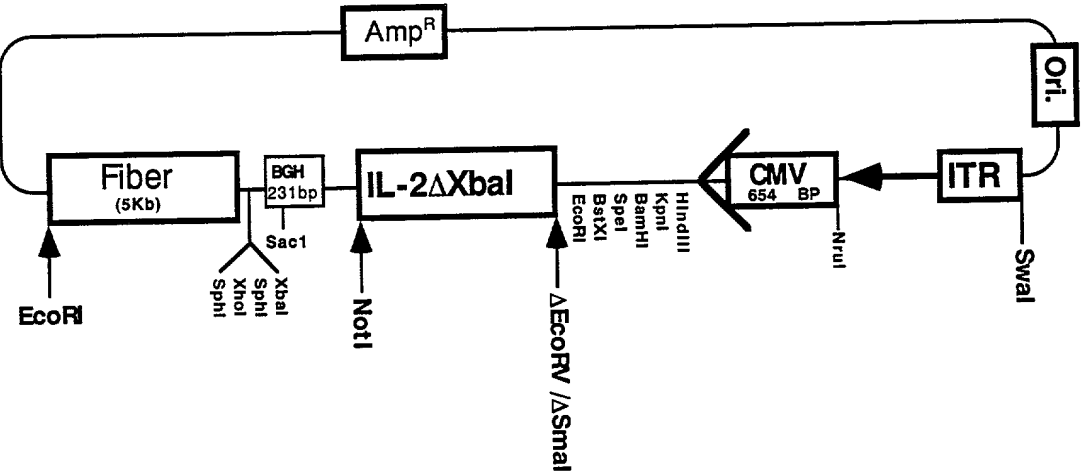
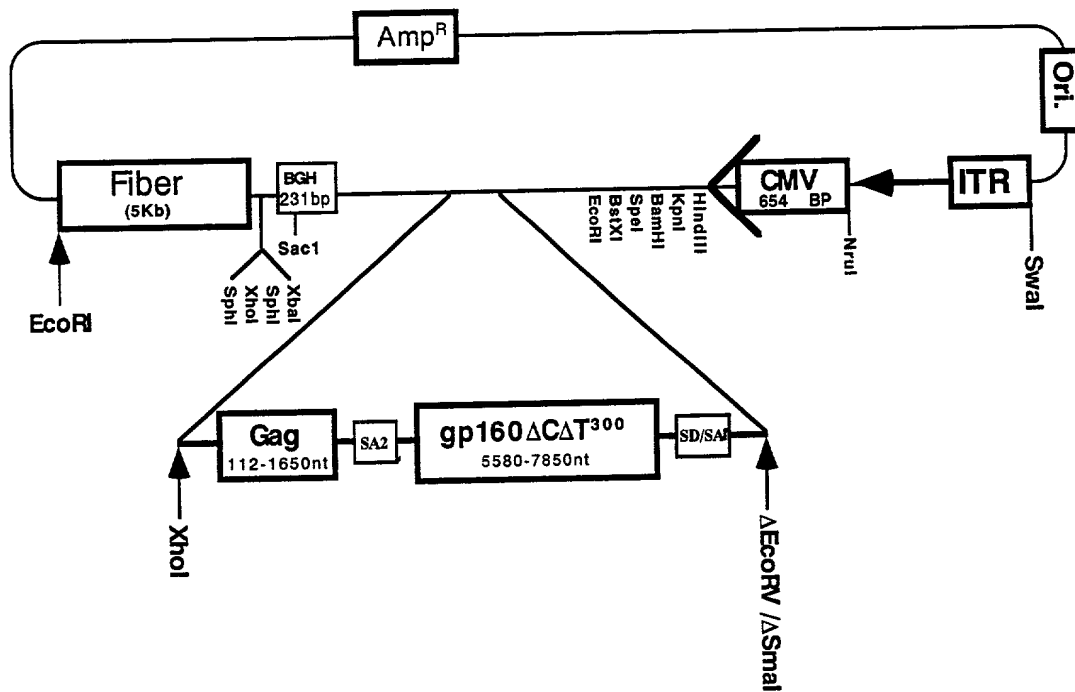


FIGURE 17 Ad-3C/E<sup>m</sup>ΔCAT<sup>300</sup>-G (from BH10 strain)

A. pRAd.ORF6-E<sup>m</sup>ΔCAT<sup>300</sup>-G



B. pLAd-3C

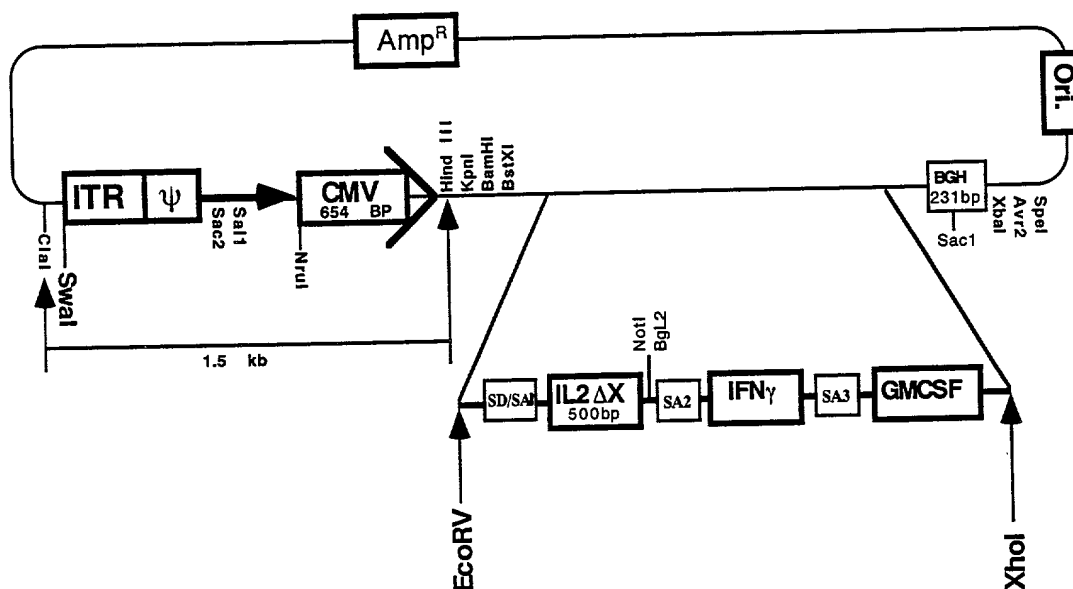
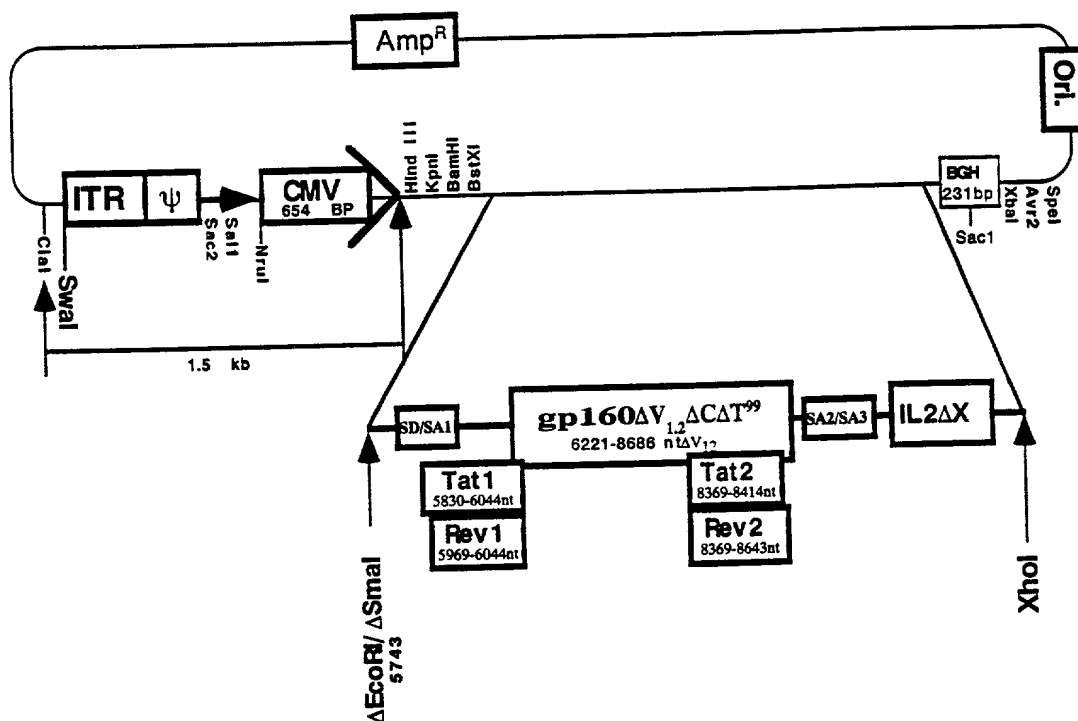




FIGURE 19

A. pLAd-E<sup>m</sup>ΔV<sub>1,2</sub>ΔCAT.T.R-IL2



B. pRAAd.ORF6-G.IL2

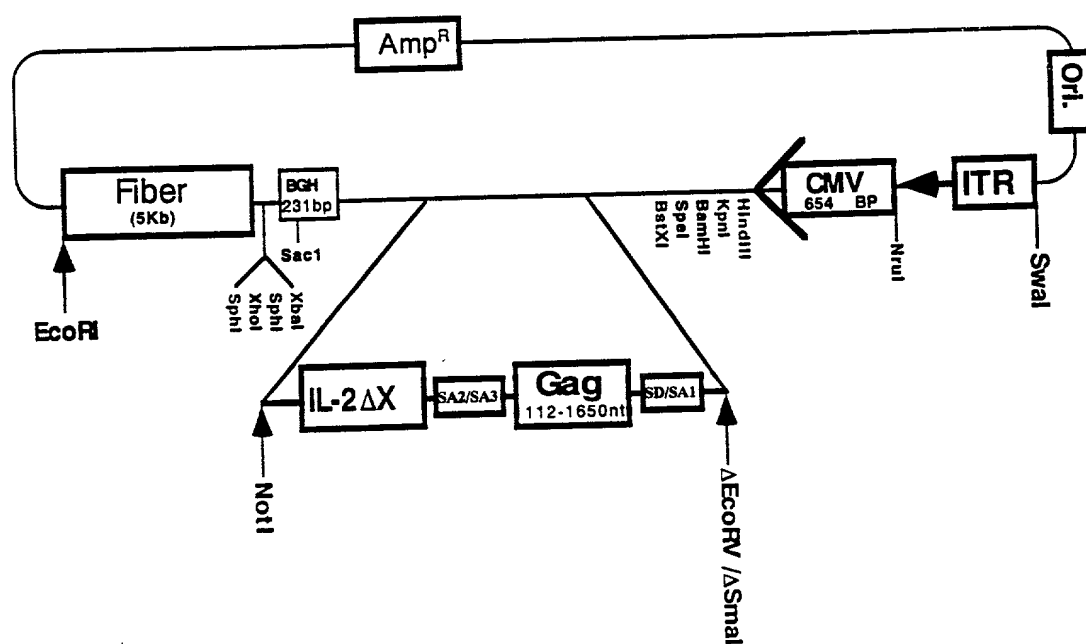
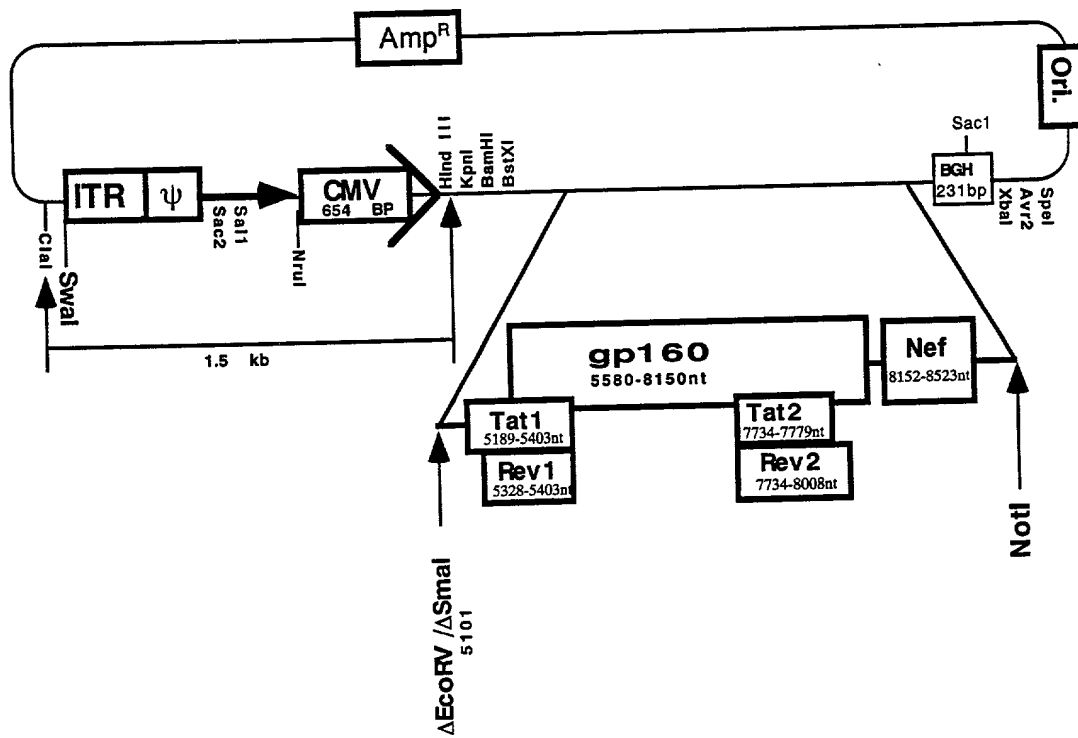


FIGURE 20

pLAd-ETRN



10.1	0.000
10.2	0.000
10.3	0.000
10.4	0.000
10.5	0.000
10.6	0.000
10.7	0.000
10.8	0.000
10.9	0.000
11.0	0.000
11.1	0.000
11.2	0.000
11.3	0.000
11.4	0.000
11.5	0.000
11.6	0.000
11.7	0.000
11.8	0.000
11.9	0.000
12.0	0.000
12.1	0.000
12.2	0.000
12.3	0.000
12.4	0.000
12.5	0.000
12.6	0.000
12.7	0.000
12.8	0.000
12.9	0.000
13.0	0.000
13.1	0.000
13.2	0.000
13.3	0.000
13.4	0.000
13.5	0.000
13.6	0.000
13.7	0.000
13.8	0.000
13.9	0.000
14.0	0.000
14.1	0.000
14.2	0.000
14.3	0.000
14.4	0.000
14.5	0.000
14.6	0.000
14.7	0.000
14.8	0.000
14.9	0.000
15.0	0.000
15.1	0.000
15.2	0.000
15.3	0.000
15.4	0.000
15.5	0.000
15.6	0.000
15.7	0.000
15.8	0.000
15.9	0.000
16.0	0.000
16.1	0.000
16.2	0.000
16.3	0.000
16.4	0.000
16.5	0.000
16.6	0.000
16.7	0.000
16.8	0.000
16.9	0.000
17.0	0.000
17.1	0.000
17.2	0.000
17.3	0.000
17.4	0.000
17.5	0.000
17.6	0.000
17.7	0.000
17.8	0.000
17.9	0.000
18.0	0.000
18.1	0.000
18.2	0.000
18.3	0.000
18.4	0.000
18.5	0.000
18.6	0.000
18.7	0.000
18.8	0.000
18.9	0.000
19.0	0.000
19.1	0.000
19.2	0.000
19.3	0.000
19.4	0.000
19.5	0.000
19.6	0.000
19.7	0.000
19.8	0.000
19.9	0.000
20.0	0.000
20.1	0.000
20.2	0.000
20.3	0.000
20.4	0.000
20.5	0.000
20.6	0.000
20.7	0.000
20.8	0.000
20.9	0.000
21.0	0.000
21.1	0.000
21.2	0.000
21.3	0.000
21.4	0.000
21.5	0.000
21.6	0.000
21.7	0.000
21.8	0.000
21.9	0.000
22.0	0.000
22.1	0.000
22.2	0.000
22.3	0.000
22.4	0.000
22.5	0.000
22.6	0.000
22.7	0.000
22.8	0.000
22.9	0.000
23.0	0.000
23.1	0.000
23.2	0.000
23.3	0.000
23.4	0.000
23.5	0.000
23.6	0.000
23.7	0.000
23.8	0.000
23.9	0.000
24.0	0.000
24.1	0.000
24.2	0.000
24.3	0.000
24.4	0.000
24.5	0.000
24.6	0.000
24.7	0.000
24.8	0.000
24.9	0.000
25.0	0.000
25.1	0.000
25.2	0.000
25.3	0.000
25.4	0.000
25.5	0.000
25.6	0.000
25.7	0.000
25.8	0.000
25.9	0.000
26.0	0.000
26.1	0.000
26.2	0.000
26.3	0.000
26.4	0.000
26.5	0.000
26.6	0.000
26.7	0.000
26.8	0.000
26.9	0.000
27.0	0.000
27.	

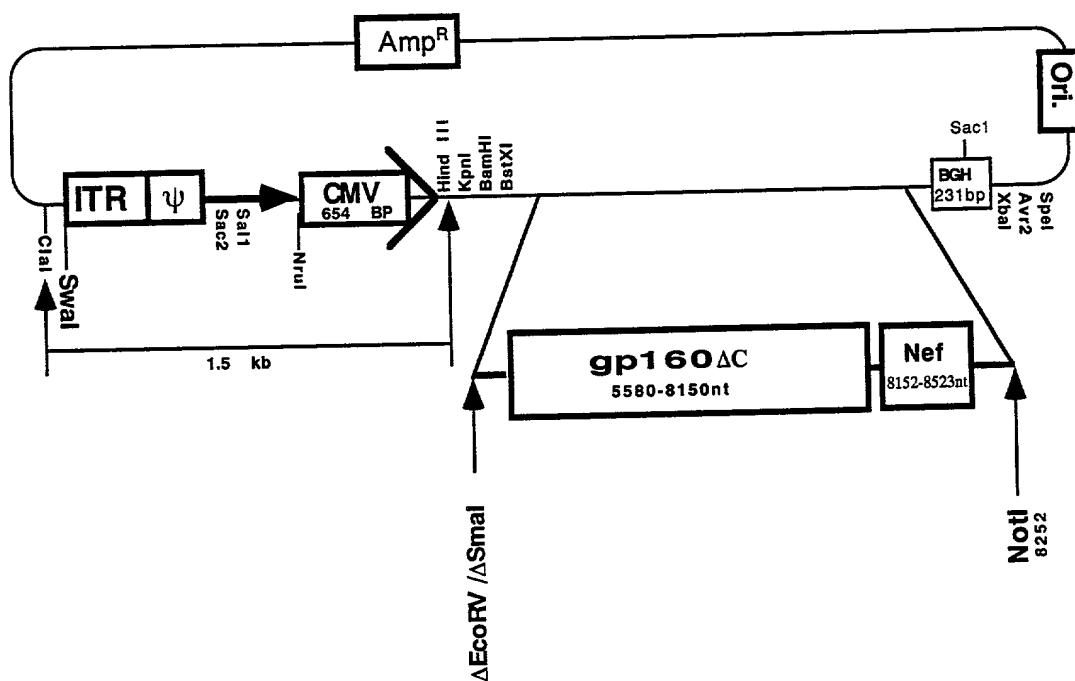


FIGURE 22

pLAd-E<sup>m</sup>ΔCAT<sup>300</sup>.T

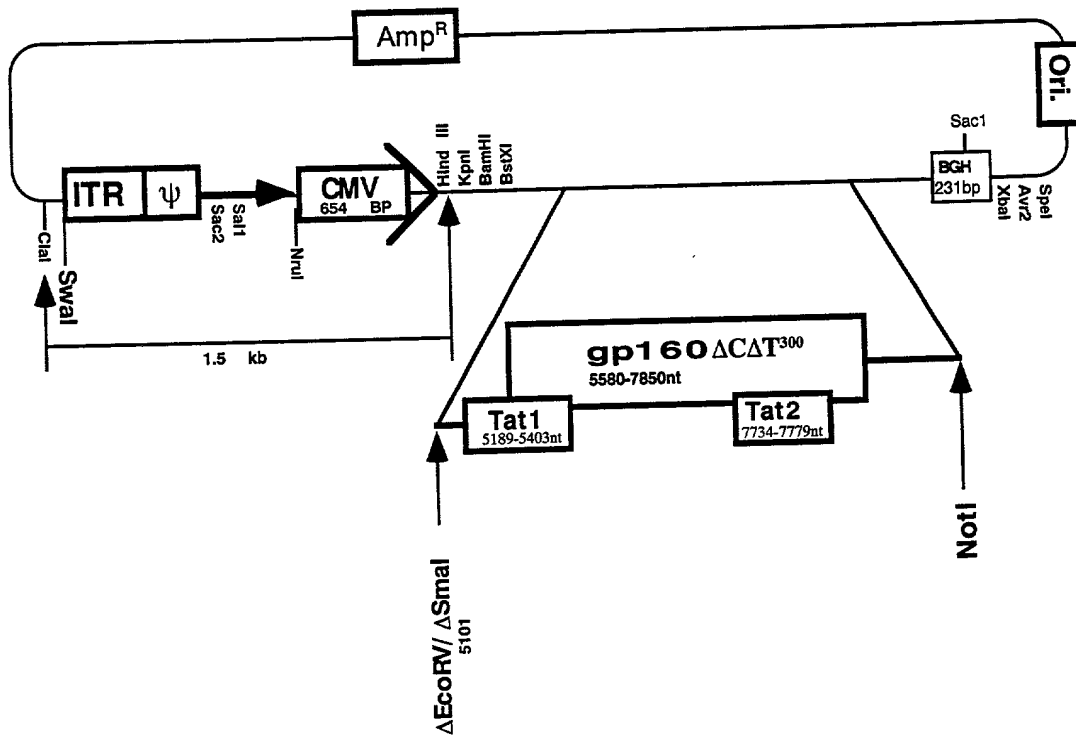
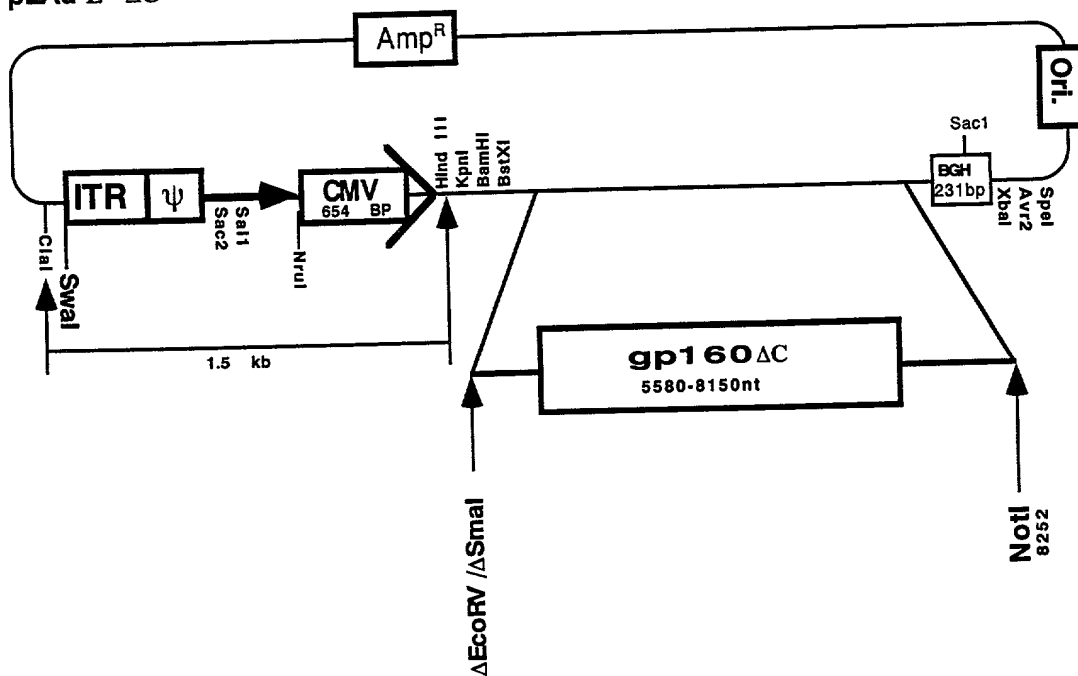
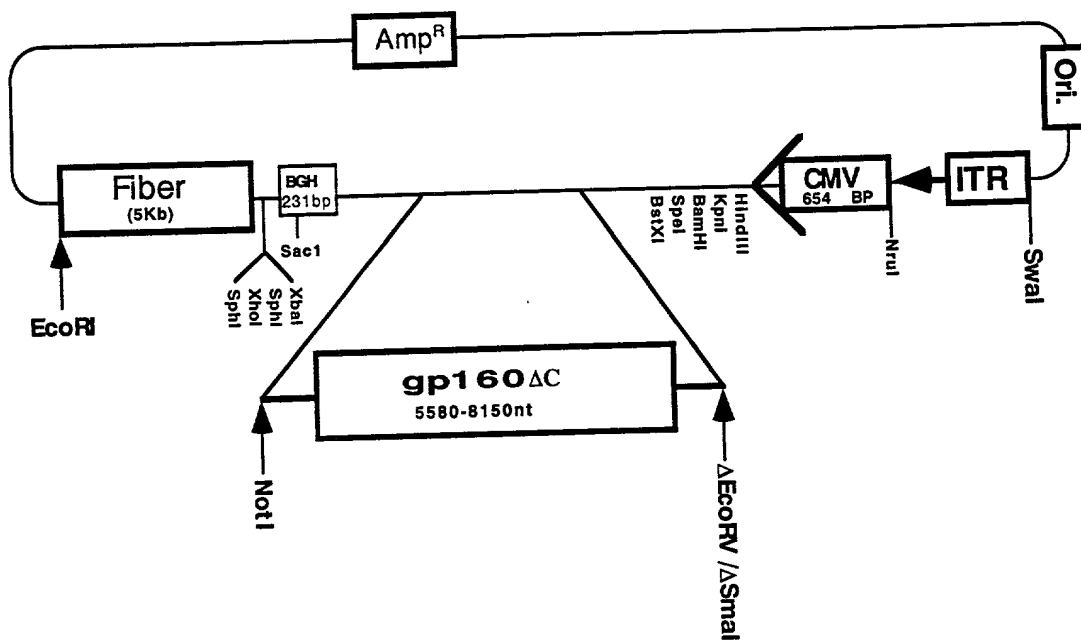


FIGURE 23

A. pLAd-E<sup>m</sup> $\Delta$ C

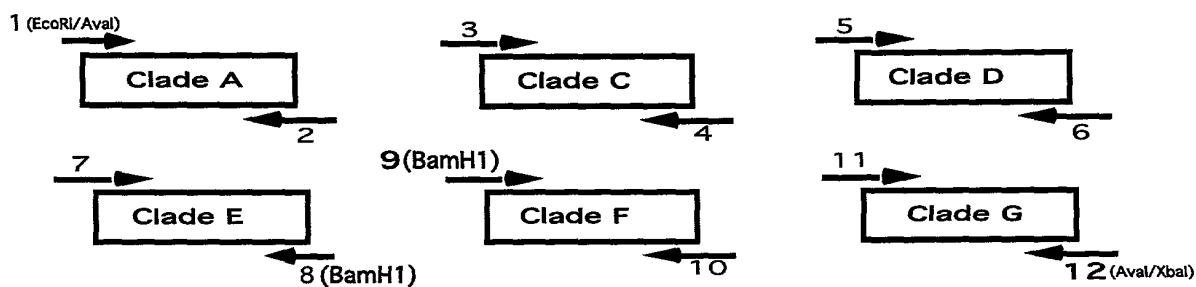


B. pRAd.ORF6-E<sup>m</sup> $\Delta$ C

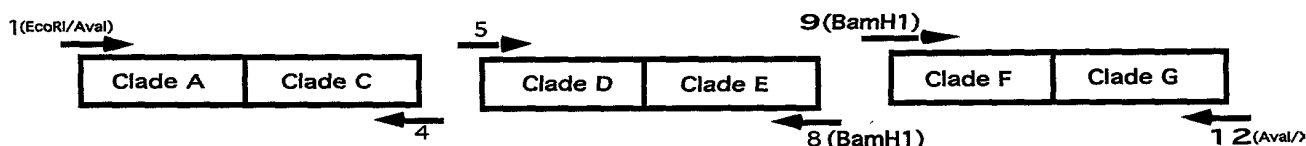


# FIGURE 24

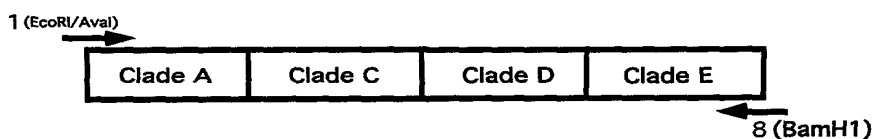
## Step 1. Amplification of each individual clone A-G



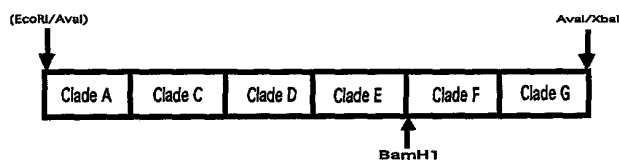
## Step 2. Amplification of every two Clones AC, DE, FG



## Step 3. Amplification of Clones ACDE



## Step 4. Cloning the multi-clones into pSP73 vector



## Step 5. Generating of a duplicated multi-clones

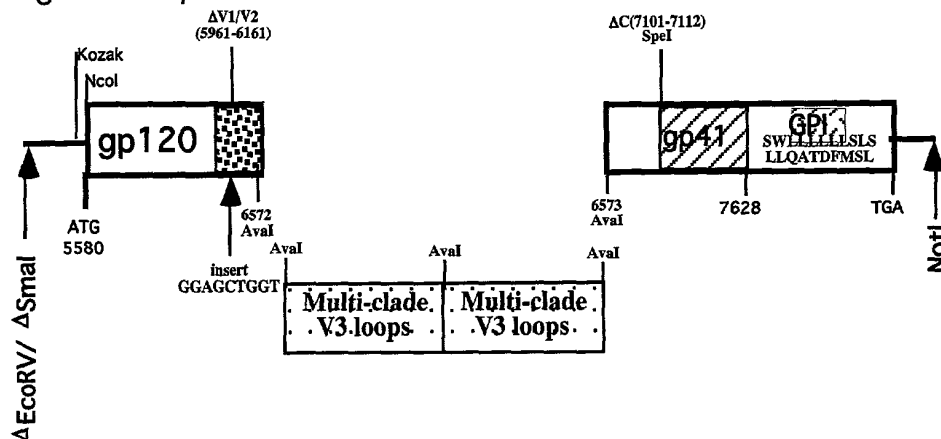


FIGURE 25

pLAd-E<sup>m</sup>.V3

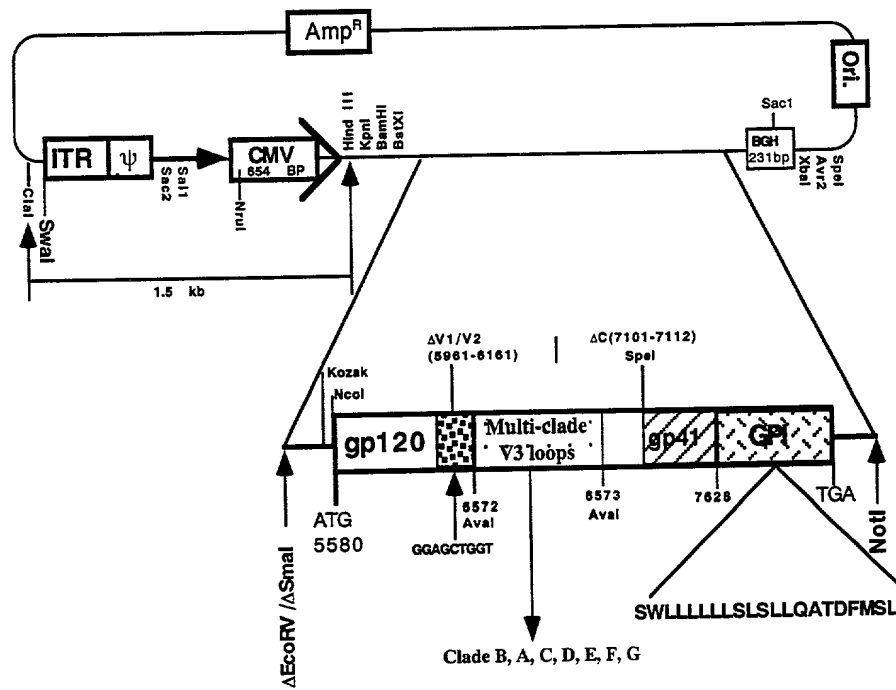
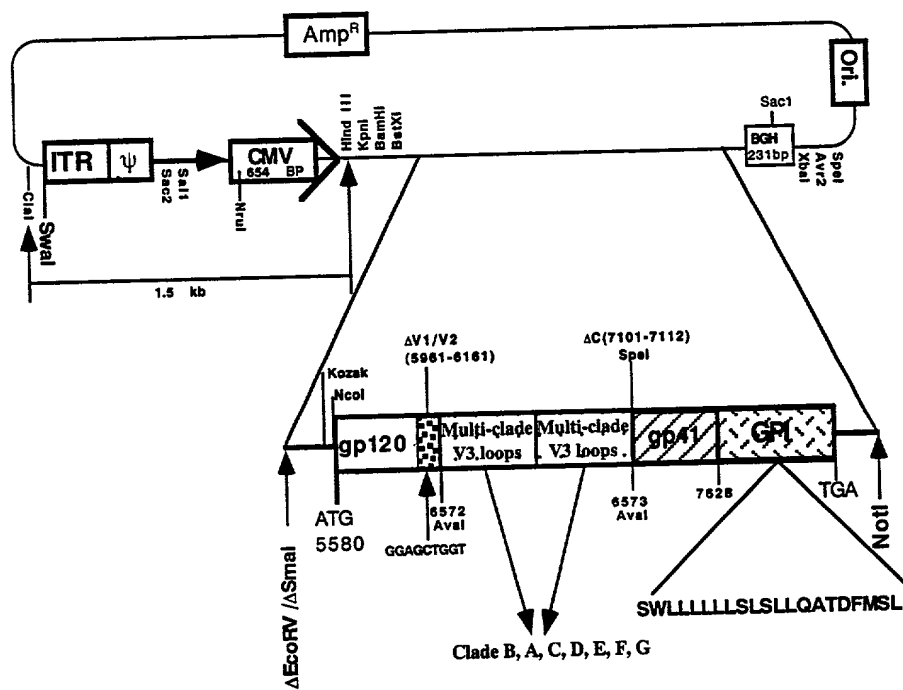
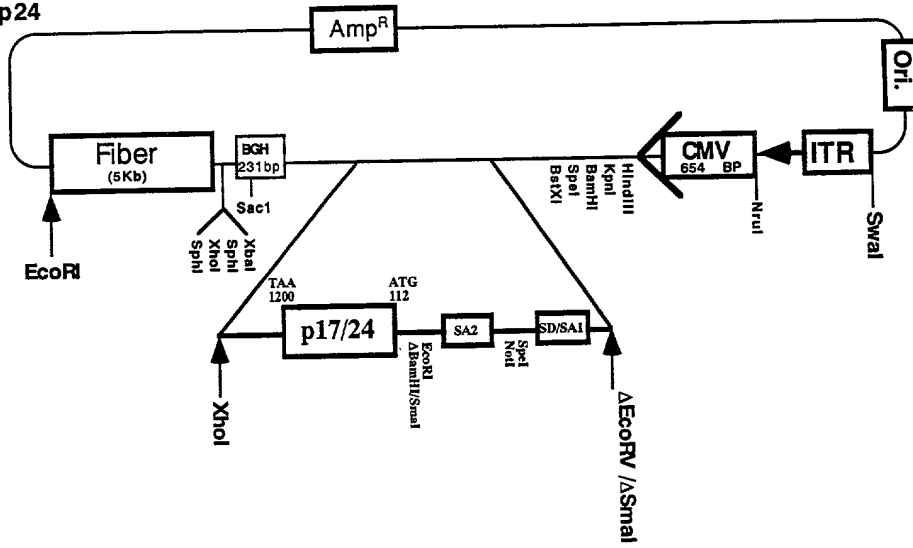


FIGURE 26

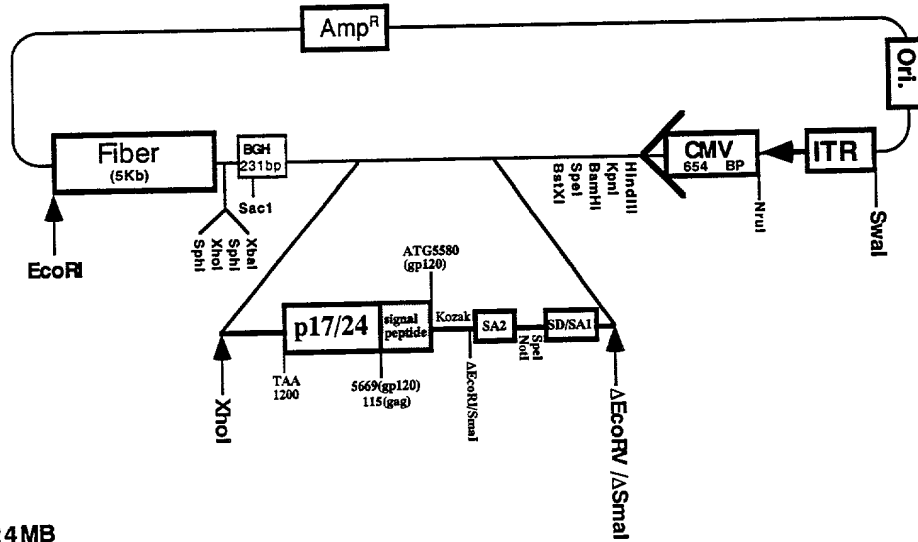


# FIGURE 27

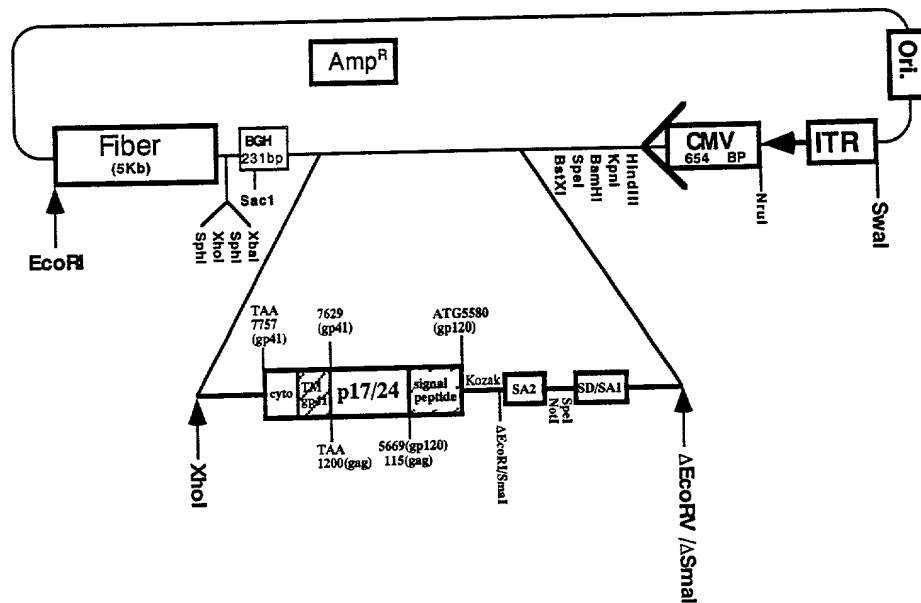
## A. pRAd.ORF6-p17/p24



## B. pRAd.ORF6-p17/24sec

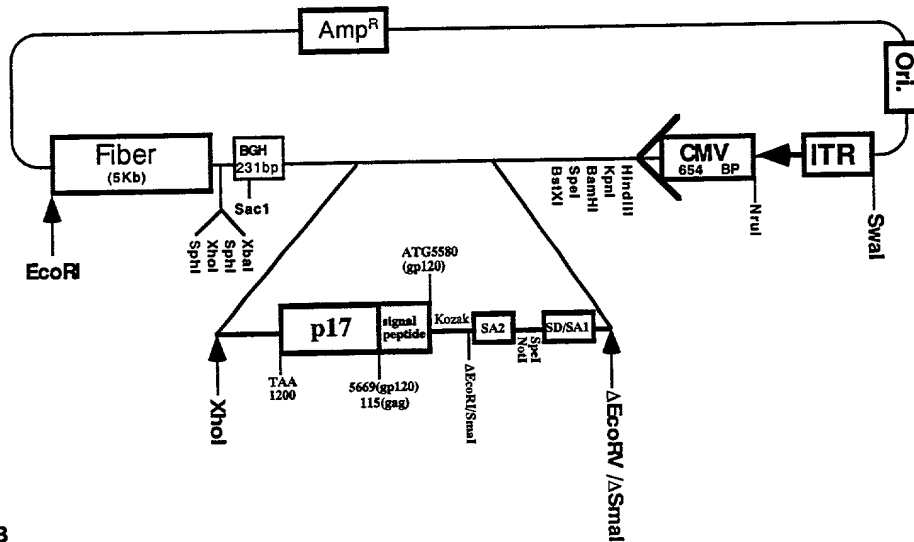


## C. pRAd.ORF6-p17/24MB



Variable	Mean	SD	Min	Max
Age	35.2	10.5	18	65
Gender	50.0	50.0	0	100
Marital status	65.0	48.0	0	100
Education	12.5	1.5	9	16
Income	3500	1500	1000	8000
Health status	75.0	25.0	50	100
Stress level	60.0	20.0	40	80
Life satisfaction	70.0	15.0	50	90
Work satisfaction	65.0	18.0	45	85
Family satisfaction	72.0	16.0	52	92
Community satisfaction	68.0	17.0	48	88
Overall well-being	70.0	15.0	50	90
Physical health	75.0	20.0	55	95
Mental health	65.0	15.0	45	85
Social health	70.0	18.0	50	90
Emotional health	68.0	16.0	48	88
Financial health	60.0	12.0	40	80
Environmental health	72.0	14.0	52	92
Cultural health	65.0	13.0	45	85
Healthcare access	78.0	10.0	60	95
Healthcare quality	70.0	12.0	55	85
Healthcare cost	65.0	11.0	45	80
Healthcare coverage	85.0	8.0	70	95
Healthcare satisfaction	75.0	10.0	60	90
Healthcare accessibility	70.0	11.0	55	85
Healthcare equity	68.0	9.0	50	80
Healthcare transparency	72.0	10.0	55	85
Healthcare accountability	70.0	11.0	55	85
Healthcare innovation	75.0	12.0	60	90
Healthcare research	78.0	10.0	65	90
Healthcare education	72.0	11.0	55	85
Healthcare communication	70.0	10.0	55	85
Healthcare collaboration	75.0	11.0	60	90
Healthcare partnership	72.0	10.0	55	85
Healthcare leadership	70.0	11.0	55	85
Healthcare governance	75.0	12.0	60	90
Healthcare regulation	72.0	11.0	55	85
Healthcare policy	70.0	10.0	55	85
Healthcare strategy	75.0	11.0	60	90
Healthcare vision	72.0	10.0	55	85
Healthcare mission	70.0	11.0	55	85
Healthcare values	75.0	12.0	60	90
Healthcare ethics	72.0	11.0	55	85
Healthcare integrity	70.0	10.0	55	85
Healthcare honesty	75.0	11.0	60	90
Healthcare trust	72.0	10.0	55	85
Healthcare respect	70.0	11.0	55	85
Healthcare dignity	75.0	12.0	60	90
Healthcare autonomy	72.0	11.0	55	85
Healthcare privacy	70.0	10.0	55	85
Healthcare security	75.0	11.0	60	90
Healthcare safety	72.0	10.0	55	85
Healthcare risk	70.0	11.0	55	85
Healthcare harm	75.0	12.0	60	90
Healthcare benefit	72.0	11.0	55	85
Healthcare utility	70.0	10.0	55	85
Healthcare value	75.0	11.0	60	90
Healthcare quality	72.0	10.0	55	85
Healthcare cost	70.0	11.0	55	85
Healthcare coverage	75.0	12.0	60	90
Healthcare satisfaction	72.0	11.0	55	85
Healthcare accessibility	70.0	10.0	55	85
Healthcare equity	75.0	11.0	60	90
Healthcare transparency	72.0	10.0	55	85
Healthcare accountability	70.0	11.0	55	85
Healthcare innovation	75.0	12.0	60	90
Healthcare research	72.0	11.0	55	85
Healthcare education	70.0	10.0	55	85
Healthcare communication	75.0	11.0	60	90
Healthcare collaboration	72.0	10.0	55	85
Healthcare partnership	70.0	11.0	55	85
Healthcare leadership	75.0	12.0	60	90
Healthcare governance	72.0	11.0	55	85
Healthcare policy	70.0	10.0	55	85
Healthcare strategy	75.0	11.0	60	90
Healthcare vision	72.0	10.0	55	85
Healthcare mission	70.0	11.0	55	85
Healthcare values	75.0	12.0	60	90

**B. pRAd. ORF6-p17 sec**



Variable	Mean	SD	Min	Max
Age	34.5	10.2	18	65
Gender	0.52	0.50	0	1
Marital status	0.65	0.48	0	1
Education	12.5	1.5	9	16
Income	15.2	5.8	5	35
Occupation	1.2	0.8	0	2
Health status	1.8	0.9	1	3
Stress level	2.5	1.2	1	4
Life satisfaction	3.2	1.5	1	5
Resilience	2.8	1.1	1	4
Optimism	3.5	1.3	1	5
Gratitude	3.8	1.4	1	5
Forgiveness	3.6	1.3	1	5
Empathy	3.4	1.2	1	5
Compassion	3.3	1.1	1	5
Kindness	3.7	1.4	1	5
Generosity	3.9	1.5	1	5
Patience	3.6	1.3	1	5
Humility	3.5	1.2	1	5
Modesty	3.4	1.1	1	5
Meekness	3.3	1.0	1	5
Gentleness	3.2	0.9	1	5
Mildness	3.1	0.8	1	5
Docility	3.0	0.7	1	5
Submissiveness	2.9	0.6	1	5
Obedience	2.8	0.5	1	5
Respectfulness	2.7	0.4	1	5
Politeness	2.6	0.3	1	5
Courtesy	2.5	0.2	1	5
Consideration	2.4	0.1	1	5
Thoughtfulness	2.3	0.1	1	5
Attentiveness	2.2	0.1	1	5
Responsive	2.1	0.1	1	5
Helpful	2.0	0.1	1	5
Cooperative	1.9	0.1	1	5
Compliant	1.8	0.1	1	5
Conformable	1.7	0.1	1	5
Adaptable	1.6	0.1	1	5
Flexible	1.5	0.1	1	5
Accommodating	1.4	0.1	1	5
Tolerant	1.3	0.1	1	5
Understanding	1.2	0.1	1	5
Open-minded	1.1	0.1	1	5
Receptive	1.0	0.1	1	5
Amiable	0.9	0.1	1	5
Approachable	0.8	0.1	1	5
Accessible	0.7	0.1	1	5
Available	0.6	0.1	1	5
Reachable	0.5	0.1	1	5
Connectable	0.4	0.1	1	5
Engageable	0.3	0.1	1	5
Interactive	0.2	0.1	1	5
Participative	0.1	0.1	1	5

**C. pRAd. ORF6-p24 MB**

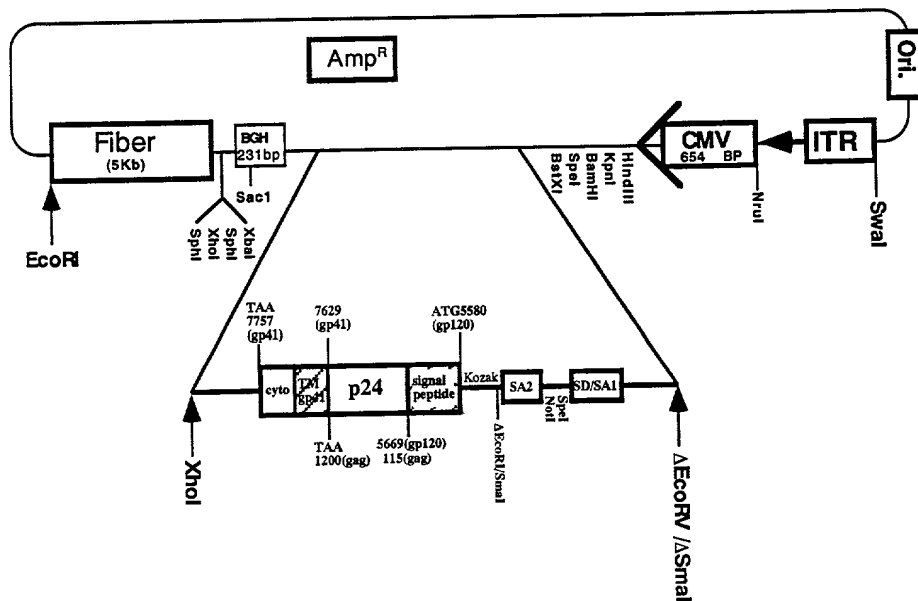


FIGURE 30 Adenoviral construct of Ad-E<sup>m</sup>.V3<sup>m</sup>/p17/24MB

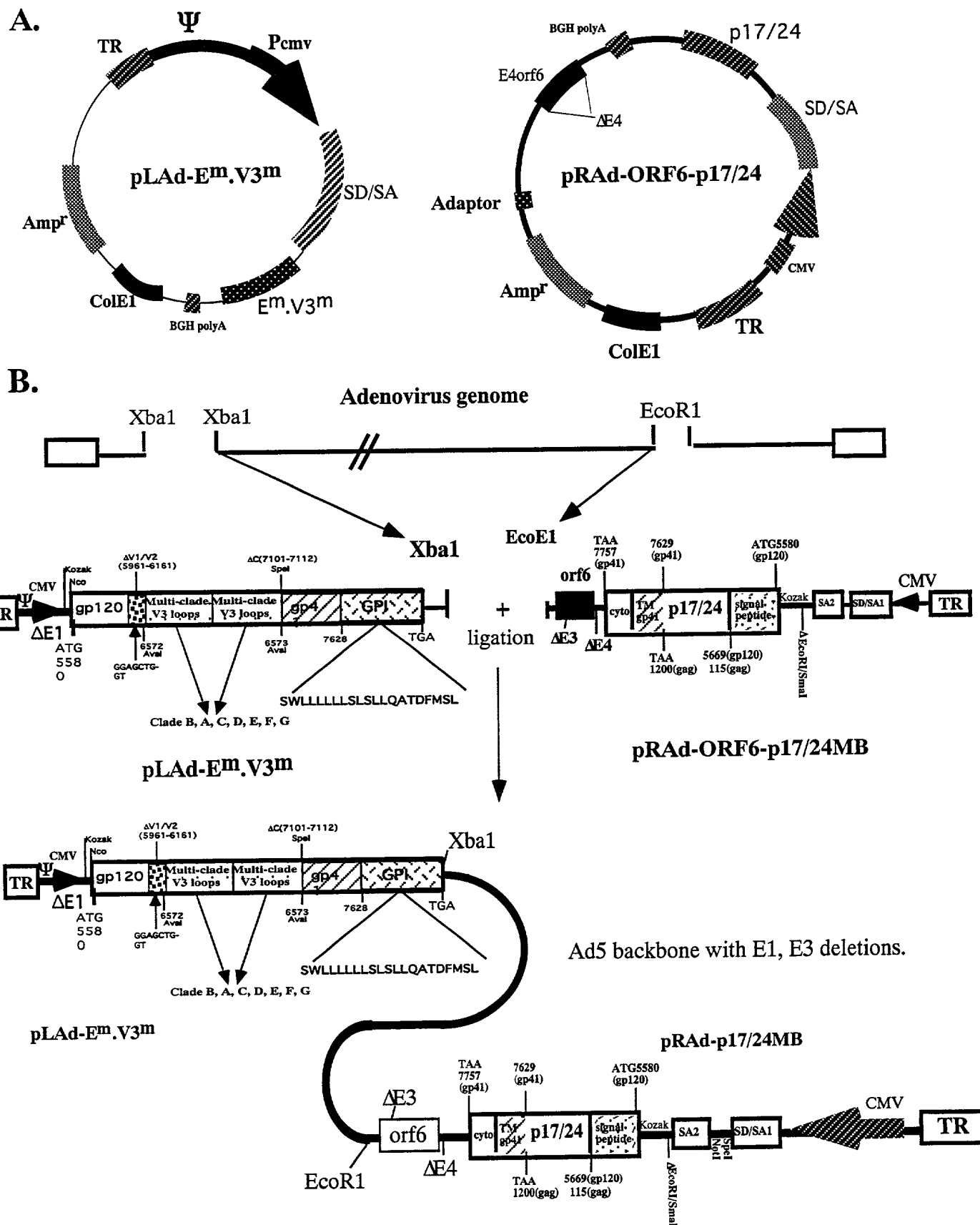


FIGURE 31 Adenoviral construct of Ad-Em.V3m/p17MB

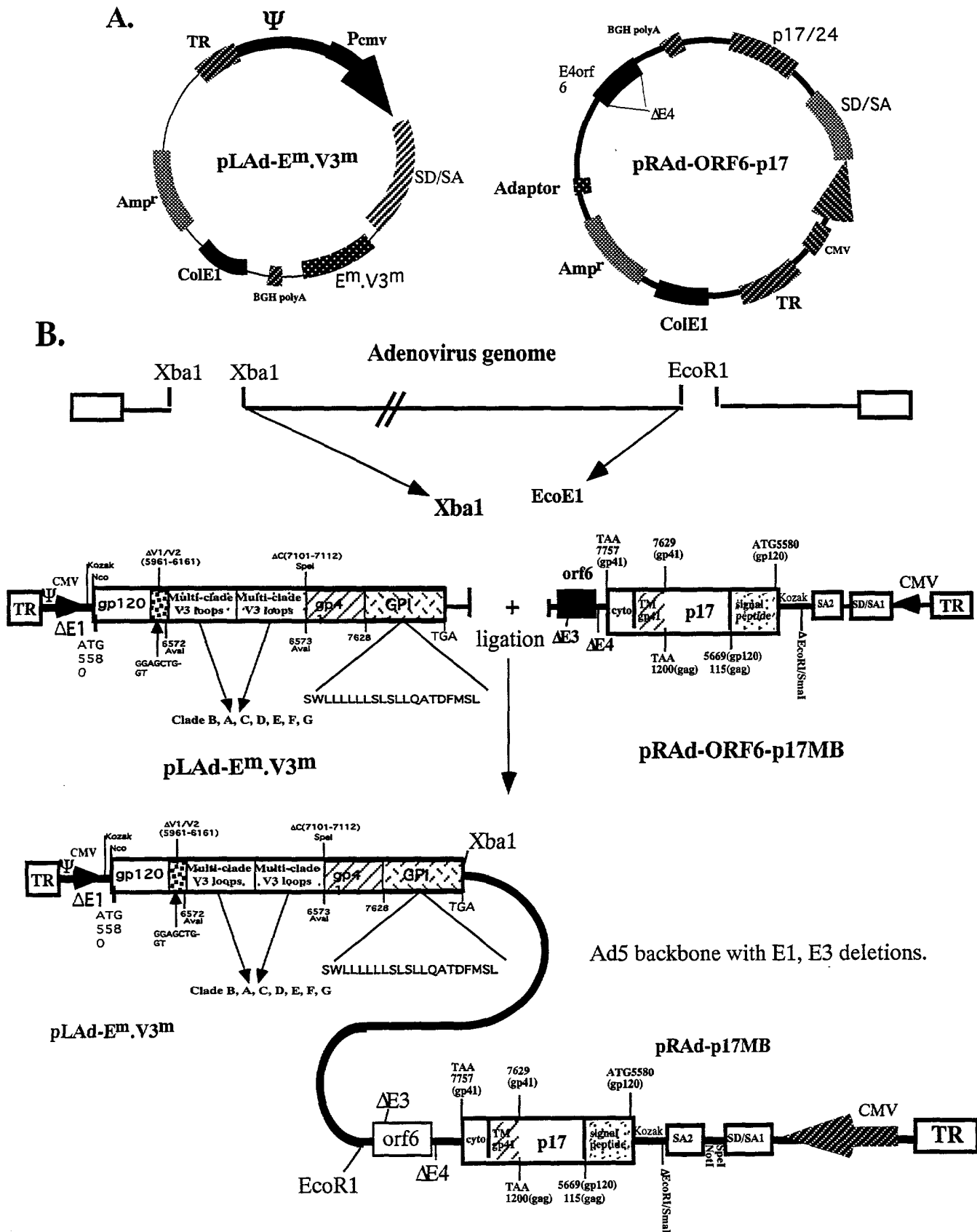


FIGURE 32 Adenoviral construct of Ad-Em.V3m/p24MB

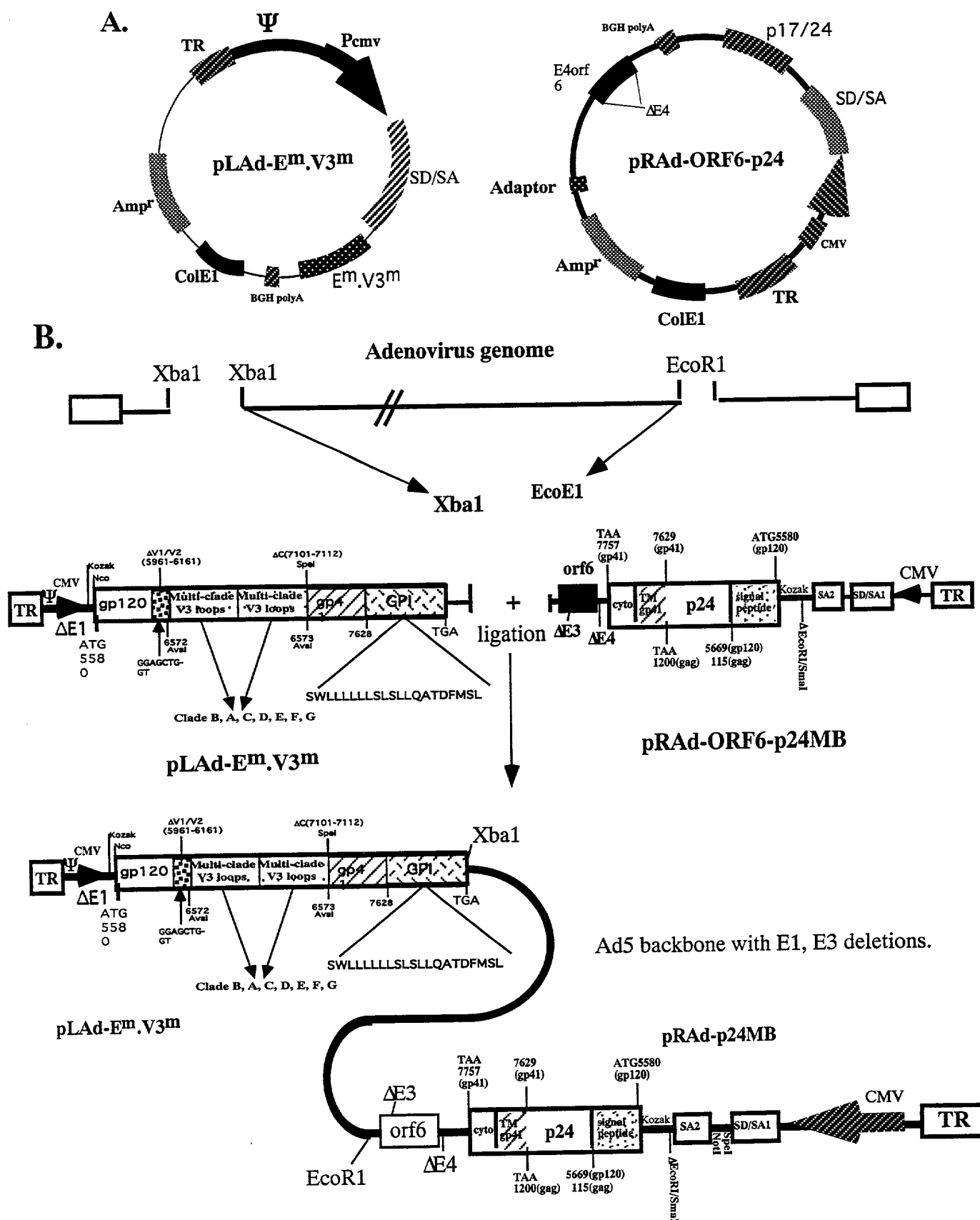


FIGURE 33

pLAd-E<sup>m</sup>ΔCAT<sup>300</sup>.V3<sup>m</sup>.T.

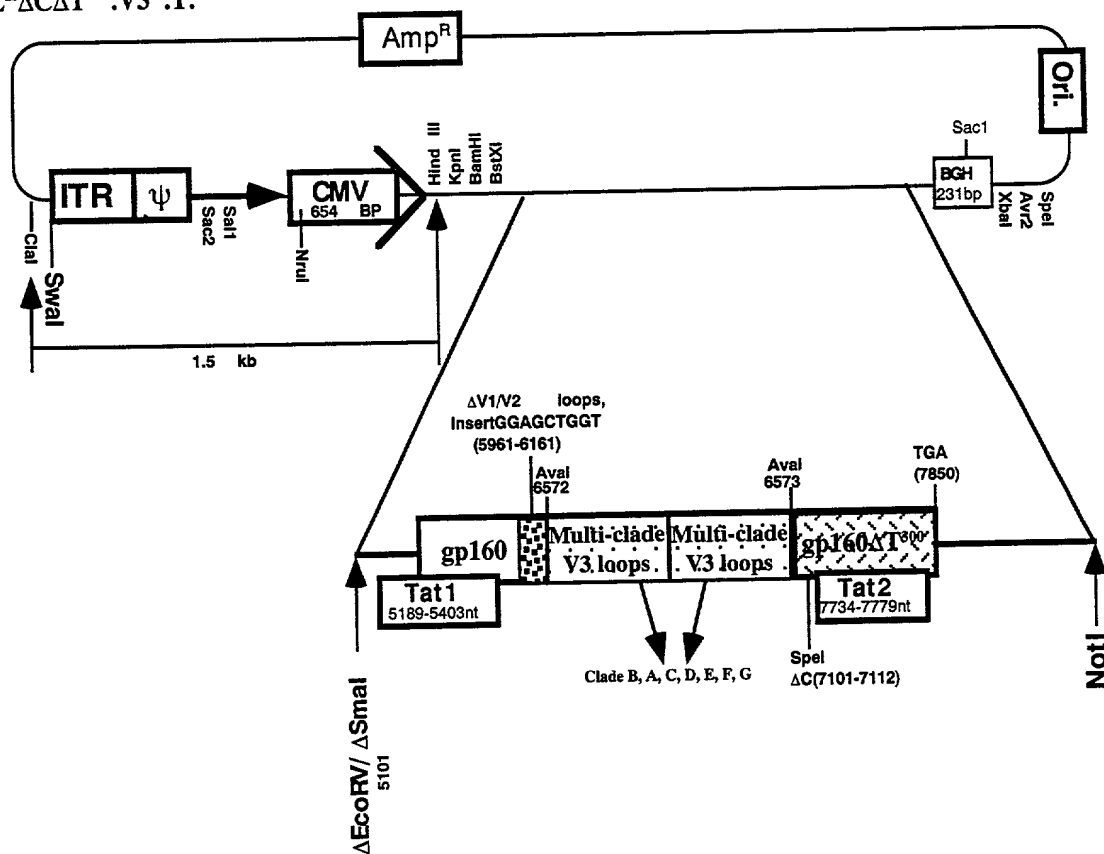
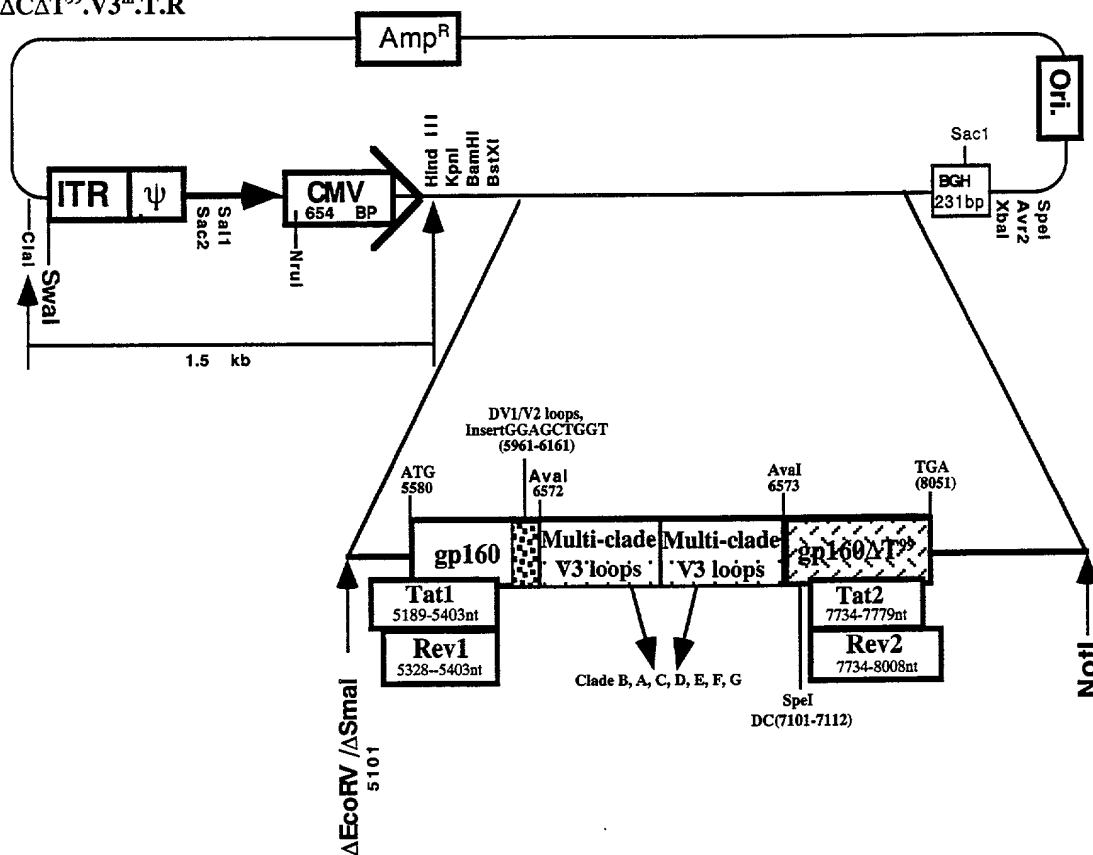


Table 1. Demographic characteristics of the study population	
Age (years)	65.2 ± 1.2
Gender (male/female)	102/108
Education (years)	12.5 ± 0.5
Marital status (married/divorced/widowed)	150/30/20
Occupation (retired/working)	150/30
Income (€ per month)	1,200 ± 100
Health status (good/poor)	180/20
Smoking status (smoker/non-smoker)	80/100
Alcohol consumption (yes/no)	40/140
Comorbidities (hypertension/diabetes/cholesterol)	120/50/80
Medication (yes/no)	100/80
Family history (yes/no)	60/120
Stress level (high/low)	70/110
Social support (yes/no)	130/50
Quality of life (high/low)	140/40
Life satisfaction (yes/no)	150/30
Overall health (good/poor)	160/20
Physical activity (yes/no)	90/90
Dietary habits (healthy/unhealthy)	110/70
Sleep quality (good/poor)	130/50
Mental health (stable/unstable)	140/40
Emotional well-being (high/low)	150/30
Life expectancy (years)	15.2 ± 0.5
Healthcare utilization (yes/no)	120/60
Health insurance (yes/no)	180/20
Healthcare costs (€ per year)	1,500 ± 200
Healthcare satisfaction (yes/no)	140/40
Healthcare access (yes/no)	160/20
Healthcare quality (high/low)	170/10
Healthcare safety (yes/no)	180/20
Healthcare effectiveness (yes/no)	190/10
Healthcare equity (yes/no)	200/0
Healthcare transparency (yes/no)	210/0
Healthcare accountability (yes/no)	220/0
Healthcare responsibility (yes/no)	230/0
Healthcare integrity (yes/no)	240/0
Healthcare honesty (yes/no)	250/0
Healthcare justice (yes/no)	260/0
Healthcare fairness (yes/no)	270/0
Healthcare kindness (yes/no)	280/0
Healthcare compassion (yes/no)	290/0
Healthcare empathy (yes/no)	300/0
Healthcare respect (yes/no)	310/0
Healthcare dignity (yes/no)	320/0
Healthcare autonomy (yes/no)	330/0
Healthcare privacy (yes/no)	340/0
Healthcare confidentiality (yes/no)	350/0
Healthcare security (yes/no)	360/0
Healthcare safety (yes/no)	370/0
Healthcare effectiveness (yes/no)	380/0
Healthcare equity (yes/no)	390/0
Healthcare transparency (yes/no)	400/0
Healthcare accountability (yes/no)	410/0
Healthcare responsibility (yes/no)	420/0
Healthcare integrity (yes/no)	430/0
Healthcare honesty (yes/no)	440/0
Healthcare justice (yes/no)	450/0
Healthcare fairness (yes/no)	460/0
Healthcare kindness (yes/no)	470/0
Healthcare compassion (yes/no)	480/0
Healthcare empathy (yes/no)	490/0
Healthcare respect (yes/no)	500/0
Healthcare dignity (yes/no)	510/0
Healthcare autonomy (yes/no)	520/0
Healthcare privacy (yes/no)	530/0
Healthcare confidentiality (yes/no)	540/0
Healthcare security (yes/no)	550/0
Healthcare safety (yes/no)	560/0
Healthcare effectiveness (yes/no)	570/0
Healthcare equity (yes/no)	580/0
Healthcare transparency (yes/no)	590/0
Healthcare accountability (yes/no)	600/0
Healthcare responsibility (yes/no)	610/0
Healthcare integrity (yes/no)	620/0
Healthcare honesty (yes/no)	630/0
Healthcare justice (yes/no)	640/0
Healthcare fairness (yes/no)	650/0
Healthcare kindness (yes/no)	660/0
Healthcare compassion (yes/no)	670/0
Healthcare empathy (yes/no)	680/0
Healthcare respect (yes/no)	690/0
Healthcare dignity (yes/no)	700/0
Healthcare autonomy (yes/no)	710/0
Healthcare privacy (yes/no)	720/0
Healthcare confidentiality (yes/no)	730/0
Healthcare security (yes/no)	740/0
Healthcare safety (yes/no)	750/0
Healthcare effectiveness (yes/no)	760/0
Healthcare equity (yes/no)	770/0
Healthcare transparency (yes/no)	780/0
Healthcare accountability (yes/no)	790/0
Healthcare responsibility (yes/no)	800/0
Healthcare integrity (yes/no)	810/0
Healthcare honesty (yes/no)	820/0
Healthcare justice (yes/no)	830/0
Healthcare fairness (yes/no)	840/0
Healthcare kindness (yes/no)	850/0
Healthcare compassion (yes/no)	860/0
Healthcare empathy (yes/no)	870/0
Healthcare respect (yes/no)	880/0
Healthcare dignity (yes/no)	890/0
Healthcare autonomy (yes/no)	900/0
Healthcare privacy (yes/no)	910/0
Healthcare confidentiality (yes/no)	920/0
Healthcare security (yes/no)	930/0
Healthcare safety (yes/no)	940/0
Healthcare effectiveness (yes/no)	950/0
Healthcare equity (yes/no)	960/0
Healthcare transparency (yes/no)	970/0
Healthcare accountability (yes/no)	980/0
Healthcare responsibility (yes/no)	990/0
Healthcare integrity (yes/no)	1000/0



pRAAd. ORF6-G.PI

FIGURE 35

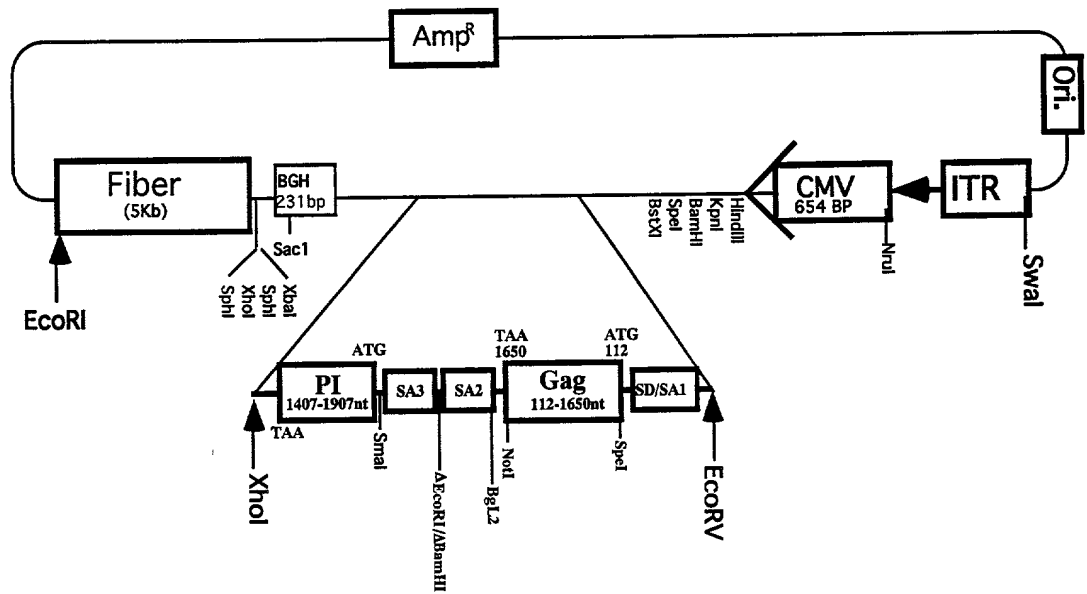


FIGURE 36

pRAAd.ORF6-G-PI

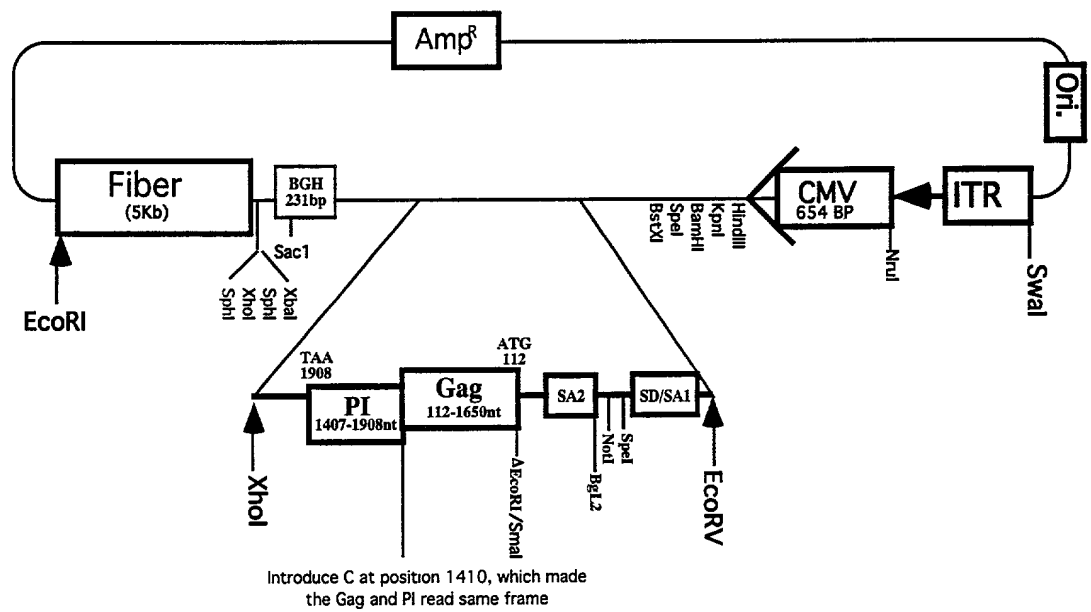
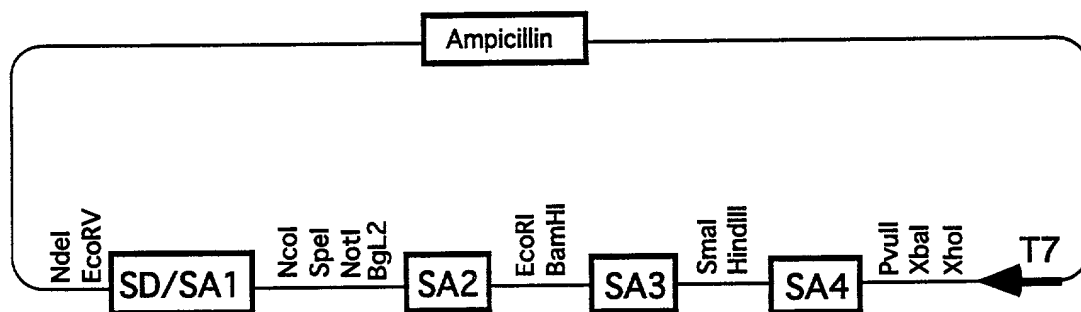


FIGURE 37

SD/SA1.2.3 vector



## FIGURE 38

### DNA Sequence of Env/Tat/Rev from BH10 clone [SEQ ID NO: 14]:

Gaattctgcaacaactgctgtttatccattttcagaattgggtgtcgacat

EcoRI

agcagaataggcgttactcgacagaggagagcaagaaatggagccagtagatcctagactagagccctgga  
agcatccaggaagtcagcctaaaactgcttgtaccaattgctattgtaaaaagtgttgccttcattgccaa  
gtttgtttcatacaaaaagccttaggcatctcctatggcaggaagaagcggagacagcgacgaagacctcc  
tcaaggcagtcagactcatcaagtttctctatcaaagcagtaagtagtacatgtaatgcaacctatacaaa  
tagcaatagtagcattagtagtagcaataataatagcaatagttgtgtggtccatagtaatcatagaatat  
aggaaaatattaagacaaaagaaaaatagacaggttaattgatagactaatagaaagagcagaagacagtgg  
caatgagagtggaaggagaaatatcagcacttgtggagatgggggtggagatggggcaccatgctccttggg  
atgttgatgatctgtagtgtacagaaaaattgtgggtcacagtctattatggggtacctgtgtggaagga  
agcaaccaccactctattttgtgcatcagatgctaaagcatatgatacagaggtacataatgtttgggcca  
cacatgcctgtgtacccacagaccccaaccacagaagtagtattggtaaatgtgacagaaaaatttaaac  
atgtggaaaaatgacatggttagaacagatgcatgaggatataatcagtttatgggatcaaagcctaaagcc  
atgtgtaaaaattaaccccactctgtgttagtttaaaagtgcactgatttgaagaatgataactaataccaata  
gtagtagcgggagaatgataatggagaaaggagagataaaaaactgctctttcaatatcagcacaagcata  
agaggttaaggtgcagaaagaatatgcattttttataaacttgatataataccaatagataatgatactac  
cagctatacgttgacaagttgtaaacacctcagtcattacacaggcctgtccaaaggatatcctttgagccaa  
ttcccatacattattgtgccccggctggttttgcgattctaaaaatgtaataataagacgttcaatggaaca  
ggaccatgtacaaatgtcagcacagtacaatgtacacatggaattaggccagtagtatcaactcaactgct  
gttaaatggcagtcctggcagaagaagaggtagtaattagatctgccaatttcacagacaatgctaaaacca  
taatagtacagctgaaccaatctgtagaaattaattgtacaagacccaacaacaatacaagaaaaagtatc  
cgtatccagagaggaccaggaggagcatttgttacaataggaaaaataggaaatagagacaagcacattg  
taacattagtagagcaaaatggaataaacactttaaaacagatagatagcaaatgaagagaacaatttgga  
ataataaaaacaataatctttaagcagtcctcaggagggggaccagaaattgtaacgcacagttttaattgt  
ggagggggaatttttctactgtaattcaacacaactgtttaatagtacttggtttaatagtacttgagta  
ctaaagggtcaaataaacactgaagggaagtgcacacatcacctcccatgcagaataaaaacaaattataaac  
atgtggcaggaagtaggaaaagcaatgtatgccctcccatcagtggaacaaattagatgttcatcaaatat  
tacagggtctgtattaacaagagatggtggaatagcaacaatgagtcagagatcttcagacctggaggag  
gagatatgagggacaattggagaagtgaattatataaatataaagtagtaaaaattgaaccattaggagta  
gcaccaccaaggcaaagagaagagtggtgcagagagaaaaagagcagtggaataggagctttgttcct  
tgggttcttgggagcagcaggaagcactatgggcgcagcgtcaatgacgtgacggtacaggccagacaat  
tattgtctggtatagtgcagcagcagaacaatttgcagagggtattgaggcgcaacagcatctgttgcaa  
ctcacagtcctggggcatcaagcagctccaggcaagaatcctggctgtggaagatacctaaaggatcaaca  
gctcctggggatttgggggtgctctggaaaactcatttgcaccactgctgtgccttggaatgctagttgga  
gtaataaatctctggaacagatttgaataacatgacctggatggagtgggacagagaaattaacaattac  
acaagcttaatacactccttaattgaagaatcgcaaaaccagcaagaaaagaatgaacaagaattattgga  
attagataaatgggcaagtttgtggaattggtttaacataacaaattggctgtggtatataaaattattca  
taatgatagtaggaggccttggttaggtttaagaatagtttttgcgtgactttctgtagtgtaatagagttagg  
cagggatattcaccattatcgtttcagacccacctcccaatcccagggggacccgacaggcccgaaaggaat  
agaagaagaaggtggagagagagacagagacagatccattcgattagtgaacggatccttagcacttatct  
gggacgatctgcggagcctgtgcctctcagctaccaccgcttgagagacttactcttgattgtaacgagg  
attgtggaacttctgggacgcaggggtgggaagccctcaaatattggtggaatctcctacagatttgga  
tcaggagctaaagaatagtgtctgttagcttgcctcaatgccacagctatagcagtagctgaggggacagata  
gggttatagaagtagtacaaggagcttatagagctattcgccacatacctagaagaataagacagggcttg  
gaaaggattttgctataagatgggtggcaagtgggtcaaaaagtagtgtggttggtggcctgctgtaaggg  
aaagaatgagacgagctgagccagcagcagatgggggtgggagcagcatctcgag

XhoI

## **FIGURE 39**

### **DNA Sequence of IL-2ΔX [SEQ ID NO: 15]:**

Tcactctctttaatcactactcacagtaacctcaactcctgccacaatgta  
caggatgcaactcctgtcttgcattgcactaagtcttgcacttgtcacaaa  
cagtgcacctacttcaagttctacaaagaaaacacagctacaactggagca  
tttactgctggatttacagatgattttgaatggaattaataattacaagaa  
tcccaaactcaccaggatgctcacatttaagttttacatgcccagaaggc  
cacagaactgaaacatcttcagtggtctgaagaagaactcaaactctgga

ΔXbaI (cta → ctt)

ggaagtgctaaatttagctcaaagcaaaaactttcacttaagacccagggg  
cttaatcagcaatatcaacgtaatagttctggaactaaagggatctgaaac  
aacattcatgtgtgaatatgctgatgagacagcaaccattgtagaatttct  
gaacagatggattaccttttgtcaaagcatcatctcaacactaacttga

## FIGURE 40

### DNA Sequence of Env<sup>m</sup>ΔCAT<sup>300</sup> (HIV strain BH10) [SEQ ID NO: 16]:

**Gaattc**gccacccatggggagtgaaggagaaatatcagcacttgtggagatg

EcoRI Kozak NcoI

ggggtggagatggggcaccatgctccttgggatgttgatgatctgtagtgctacagaaaaa  
ttgtgggtcacagtctattatggggtacctgtgtggaaggaagcaaccaccactctat  
gtgcatcagatgctaaagcatatgatacagaggtacataaatgtttgggccacacatg  
tgtacccacagaccccaaccacaagaagtagtattggtaaagtgtgacagaaaatttta  
atgtggaaaaatgacatggtagaacagatgcatgaggatataatcagtttatgggatcaa  
gcctaaagccatgtgtaaaattaacccactctgtgttagtttaaagtgcactgatttgaa  
gaatgataactaataccaatagtagtagcgggagaatgataatggagaaaggagagataaaa  
aactgctctttcaatatcagcacaagcataagaggtaagggtgcagaaagaatatgcatttt  
ttataaaacttgatataataccaatagataatgatactaccagctatacgttgacaagttg  
taacacctcagtcattacacaggcctgtccaaagggtatcctttgagccaattcccatacat  
tattgtgccccggctgggttttgcgattctaaaatgtaataataagacgttcaatggaacag  
gaccatgtacaaatgtcagcacagtacaatgtacacatggaattaggccagtagtatcaac  
tcaactgctgttaaattggcagctctggcagaagaagaggtagtaattagatctgccaatttc  
acagacaatgctaaaaccataatagtagcagctgaaccaatctgtagaattaattgtacaa  
gacccaacaacaatacaagaaaaagtatccgtatccagagaggaccagggagagcatttgt  
tacaataggaaaaataggaaatatgagacaagcacattgtaacattagtagagcaaaatgg  
aataacacttttaaacagatagatagcaaattaagagaacaatttggaaataataaaacaa  
taatctttaagcagtcctcaggaggggaccagaaattgtaacgcacagttttaattgtgg  
aggggaatttttctactgtaattcaacacaactgtttaatagtacttgggttaatagtact  
tggagtactaaagggtcaaataacactgaagggaagtgcacaaatcaccctcccatgcagaa  
taaaacaaattataaacatgtggcaggaagtaggaaaagcaatgtatgcccctcccatcag  
tggacaaattagatgttcatcaaatattacagggctgctattaacaagagatgggtggaat  
agcaacaatgagtcagagatcttcagacctggaggaggagatatgagggacaattggagaa  
gtgaattatataaatataaagtagtaaaaattgaaccattaggagtagcaccaccaaaggc  
aaagagaagagtggtgcagACTAGTgcagtggggaataggagctt

ΔCleavage site(**agagaaaaaaga**) →SpeI

tgttccttgggttcttgggagcagcaggaagcactatgggcgagcgtcaatgacgctgac  
ggtacaggccagacaattattgtctggtatagtgcagcagcagaacaatttgcctgagggt  
attgaggcgcaacagcatctgttgcaactcacagctctggggcatcaagcagctccaggcaa  
gaatcctggctgtggaaagatacctaaggatcaacagctcctggggatttgggggttgcctc  
tggaaaactcatttgcaccactgctgtgccttgggaatgctagttaggagtaataaatctctg  
gaacagatttggaaataacatgacctggatggagtgggacagagaaattaacaattacacaa  
gcttaatacactccttaattgaagaatcgcaaaaccagcaagaaaagaatgaacaagaatt  
attggaattagataaatgggcaagtttgtggaattgggtttaacataacaaattggctgtgg  
tatataaaattattcataatgatagtaggaggttggtaggtttaagaatagtttttgcctg  
tactttctgtagtgaaatagagtttaggcagggatattcaccattatcgtttcagacccacct  
cccaatcccagggggacccgacaggcccgaagggaatagaagaagaagggtggagagagagac  
agagacagatccattcgattagtgaacggatccttagcacttatctggtaa

[illegible]

**DNA Sequence of Full length HIV-1 Gag [SEQ ID NO: 17]:**

ggctagaaggagagagaggattgggtgcgagagcgtcagttattaaagcgggggag  
aattagatcgatgggaaaaaatttcggttaaggccaggggggaaagaaaaaat  
ataaattaaaacatatagttatgggcaagcagggagctagaacgactacaac  
catcccttcagacaggatcagaagaacttagatcattatataatacagtag  
caaccctctattgtgtgcatcaaaggatagagataaaagacaccaaggaag  
ctttagacaagatagaggaagagcaaaacaaaagtaagaaaaaagcacagc  
aagcagcagctgacacaggacacagcagtcaggtcagccaaaattacccta  
tagtgcagaacatccagggggcaaattggtacatcaggccatatcacctagaa  
ctttaaatgcatgggtaaaagtagtagaagagaaggcttttcagcccagaa  
taatacccatgtttttcagcattatcagaaggagccaccccacaagatttaa  
acaccatgctaaacacagtgggggggacatcaagcagccatgcaaatgttaa  
aagagaccatcaatgaggaagctgcagaatgggatagagtacatccagtgc  
atgcagggcctattgcaccaggccagatgagagaaccaaggggaagtgaca  
tagcaggaactactagtacccttcaggaacaaataggatggatgacaaata  
atccacctatcccagtaggagaaaatttataaaaagatggataatcctgggat  
taaataaaaatagtaagaatgtatagccctaccagcatttctggacataagac  
aaggaccaaagaaccttttagagactatgtagaccggttctataaaactc  
taagagccgagcaagcttcacaggaggtaaaaaattggatgacagaaacct  
tgttggtccaaaatgcgaaccagattgtgaagactattttaaaagcattgg  
gaccagcggctacactagaagaaatgatgacagcatgtcagggagtaggag  
gacccggccataaggcaagagttttggctgaagcaatgagccaagtaacaa  
atacagctaccataatgatgcagagaggcaatttttaggaaccaagaaaga  
tggttaagtgtttcaattgttggaagaagggcacacagccagaaattgca  
gggcccctaggaaaaagggtgttggaatgtggaaaggaaggacaccaa  
tgaaagattgtactgagagacaggctaatttttttagggaagatctggcctt  
cctacaaggaaggccagggaattttcttcagagcagaccagagccaacag  
ccccaccatttcttcagagcagaccagagccaacagccccaccagaagaga  
gcttcagggtctggggtagagacaacaactccccctcagaagcaggagccga  
tagacaaggaactgtatcctttaacttccctcagatcactctttggcaacg  
accctcgtcacataaa

## FIGURE 41B

### Amino Acid Sequence of HIV-1 (Strain BH10) Gag [SEQ ID NO: 18]:

M	G	A	R	A	S	V	L	S	G	G	E	L	D	R	W	E	K
I	R	L	R	P	G	G	K	K	K	Y	K	L	K	H	I	V	W
A	S	R	E	L	E	R	L	Q	P	S	L	Q	T	G	S	E	E
L	R	S	L	Y	N	T	V	A	T	L	Y	C	V	H	Q	R	I
E	I	K	D	T	K	E	A	L	D	K	I	E	E	E	Q	N	K
S	K	K	K	A	Q	Q	A	A	A	D	T	G	H	S	S	Q	V
S	Q	N	Y	P	I	V	Q	N	I	Q	G	Q	M	V	H	Q	A
I	S	P	R	T	L	N	A	W	V	K	V	V	E	E	K	A	F
S	P	E	V	I	P	M	F	S	A	L	S	E	G	A	T	P	Q
D	L	N	T	M	L	N	T	V	G	G	H	Q	A	A	M	Q	M
L	K	E	T	I	N	E	E	A	A	E	W	D	R	V	H	P	V
H	A	G	P	I	A	P	G	Q	M	R	E	P	R	G	S	D	I
A	G	T	T	S	T	L	Q	E	Q	I	G	W	M	T	N	N	P
P	I	P	V	G	E	I	Y	K	R	I	I	I	L	G	L	N	K
I	V	R	M	Y	S	P	T	S	I	L	D	I	R	Q	N	P	Q
E	P	F	R	D	Y	V	D	R	F	Y	K	T	L	V	A	E	A
A	S	Q	E	V	K	N	W	M	T	E	T	L	L	A	Q	N	A
N	P	D	C	A	T	I	L	K	A	L	G	P	A	A	T	L	E
E	M	M	T	M	C	Q	G	V	G	G	P	G	H	K	A	R	V
L	A	E	A	M	S	Q	V	T	N	T	A	T	I	M	M	Q	R
G	N	F	R	N	Q	R	K	M	V	K	C	F	N	C	G	K	E
G	K	T	A	R	N	C	R	A	P	R	K	K	Q	C	W	K	C
G	K	E	G	H	Q	M	K	D	C	T	E	R	F	A	N	F	L
P	E	I	W	P	S	Y	K	G	R	P	G	N	P	L	Q	S	R
P	E	P	T	A	R	P	F	L	Q	E	T	T	E	P	T	A	P
E	P	I	S	F	E	S	G	V	P	L	S	L	R	S	Q	K	Q
N	D	P	S	S	Q	*	Y	P	L	T	S	L	P	S	L	F	G

## FIGURE 42

### DNA Sequence of E<sup>m</sup>ΔCAT<sup>99</sup>.T.R (HIV strain pNL4-3) [SEQ ID NO: 19]:

Gaattctgcaacaactgctgtttatccatttcagaattgggtgtcgacatag

EcoRI

cagaataggcggttactcgacagaggagagcaagaaatggagccagtagatcctagactagagccctggaagca  
tccaggaagtcagcctaaaactgcttgtaccaattgctattgtaaaaagtggtgctttcattgccaagttgt  
ttcatgacaaaagccttaggcattctcctatggcaggaagaagcggagacagcgacgaagagctcatcagaaca  
gtcagactcatcaagcttctctatcaaagcagtaagtgtacatgtaatgcaacctataatagtagcaatagt  
agcattagtagtagcaataataatagcaatagttgtgtggtccatagtaatcatagaatataggaaaatatta  
agacaaagaaaaatagacaggttaattgatagactaatagaaagagcagaagacagtggaatgagagtgaag  
gagaagtatcagcacttgtggagatgggggtgaaatggggcaccatgctccttgggatattgatgatctgta  
gtgctacagaaaaattgtgggtcacagtctattatggggtagctgtgtggaagggaagcaaccaccactctatt  
ttgtgcatcagatgctaaagcatatgatacagaggtacataatgtttgggccacacatgctgtgtaccaca  
gaccccaaccacacaagaagtagtattggtaaatgtgacagaaaattttaacatgtggaaaaatgacatggtag  
aacagatgcatgaggatataatcagtttatgggatcaaagcctaaagccatgtgtaaaattaacccactctg  
tgtagtttaagtgcactgatttgaagaatgataactaataccaatagtagtagcgggagaatgataatggag  
aaaggagagataaaaaactgctctttcaatatcagcacaagcataaagagataaggtgcagaaagaatatgcat  
tcttttataaaacttgatatagtagtaaccaatagataatacca

gctataggttgataagttgtaacacctcagtcattacacaggcctgtccaaaggtatcctttgagccaattcc  
catacattattgtgccccgctggttttgcgattctaaaatgtaataataagacggttcaatggaacaggacca  
tgtacaaatgtcagcacagtagcaatgtacacatggaatcaggccagtagtatcaactcaactgctgttaaag  
gcagcttagcagaagaagatgtagtaattagatctgccaaatttcacagacaatgctaaaaccataatagtaca  
gctgaacacatctgtagaaattaattgtacaagacccaacaacaatacaagaaaaagtagccgtatccagagg  
ggaccaggagagcatttgttacaataggaaaaataggaaatagagacaagcacattgtaacattagtagag  
caaaatggaatgccactttaaaaacagatagctagcaaatgaagagaacaatttggaaataataaaacaataat  
ctttaagcaatcctcaggaggggacccagaaattgtaacgcacagttttaattgtggaggggaatttttctac  
tgtaattcaacacaactgtttaatagtagtcttgggttaatagtagtacttggagtagtgaaggggtcaaataacactg  
aaggaagtgcacacatcacactcccatgcagaataaaacaatttataaacatgtggcaggaagtaggaaaagc  
aatgtatgccccctcccatcagtggaacaaattagatgttcatcaaatattactgggctgctattaacaagagat  
gggtggaataacaacaatgggtccgagatcttcagacctggaggaggcgatagagggacaattggagaagtg  
aattatataaatataaagtagtaaaaattgaaccattaggagtagcaccaccaaggcaagagaagagtggt  
gcagACTAGTgcagtggaataggagctttgttccttg

ΔCleavage site (agagaaaaaga) → SpeI

ggttccttgggagcagcaggaagcactatgggctgcacgtcaatgacgctgacggtacaggccagacaattatt  
gtctgatatagtgacagcagcagaacaatttgcaggggtattgaggcgcaacagcatctgttgcaactcaca  
gtctggggcatcaaacagctccaggcaagaatcctggctgtggaaagatacctaaggatcaacagctcctgg  
ggatttgggggtgctctggaaaactcatttgcaccactgctgtgccttggatgctagttggagtaataaatc  
tctggaacagatttggaaataacatgacctggatggagtggaagacagagaaattaacaattacacaagcttaata  
cactccttaattgaagaatcgcaaaaccagcaagaaaagaatgaacaagaattattggaattagataaatggg  
caagtttgggaattgggttaacataacaaattggctgtggtatataaaattattcataatgatagtaggagg  
cttggtaggtttaagaatagtttttgcgtgactttctatagtagtaatagagttaggcagggaattaccatta  
tcgtttcagacccacctcccaatcccagggggacccgacaggcccggaaggaatagaagaagggtggagaga  
gagacagagacagatccattcgattagtgaaacggatccttagcattatctgggacgatctgcggagcctgtg  
cctcttcagctaccaccgcttgagagacttactcttgattgtaacgaggattgtggaacttctgggacgcagg  
gggtgggaagccctcaaatattgggtggaatctcctacagtattggagtcaggaactaaagaatagtgctgtta  
acttgctcaatgccacagccatagcagtagctgagtaa

## FIGURE 43

### DNA Sequence of E<sup>m</sup>ΔV<sub>12</sub>ΔCAT<sup>99</sup>.T.R (Strain pNL4-3) [SEQ ID NO: 20]:

Gaattctgcaacaactgctgtttatccatttcagaattgggtgtcgacatag

EcoRI

Cagaataggcggttactcgacagaggagagcaagaaatggagccagtagatcctagactagagccctggaagca  
tccaggaagtgcgcctaaaactgcttgaccaattgctattgtaaaaagtggtgctttcattgccagtttgt  
ttcatgacaaaagccttaggcatctcctatggcaggaagaagcggagacagcgacgaagagotcatcagaaca  
gtcagactcatcaagcttctctatcaaagcagtaagtagtacatgtaatgcaacctataatagtagcaatagt  
agcattagtagtagcaataataatagcaatagttgtgtggtccatagtaatcatagaatataggaaaatatta  
agacaaagaaaaatagacaggttaattgatagactaatagaaaagcagagaagacagtggaatgagagtggaag  
gagaagtatcagcacttgtggagatgggggtggaatggggcaccatgctccttgggatattgatgatctgta  
gtgctacagaaaaattgtgggtcacagtctattatggggtaacctgtgtggaaggaagcaaccaccactctatt  
ttgtgcatcagatgctaaagcatatgatacagaggtaacataatgtttgggccacacatgcctgtgtaccaca  
gaccccaacccacaagaagtagtattggtaaatgtgacagaaaattttaacatgtggaaaaatgacatggtag  
aacagatgcatgaggatataatcagtttatgggatcaaagcctaaagccatgtgtaaaattaaccccactctg  
tggtt ΔV1 and V2 loops

Agttgtaacacctcagtcattacacaggcctgtccaaaggtatcctttgagccaattcccatacattattgtg  
ccccggtggttttgcgattctaaaatgtaataataagacgttcaatggaacaggaccatgtacaaatgtcag  
cacagtacaatgtacacatggaatcaggccagtagtatcaactcaactgctgttaaattggcagtcctagcagaa  
gaagatgtagtaattagatctgccaatttcacagacaatgctaaaaccataatagtagcagctgaacacatctg  
tagaaattaattgtacaagaccacaacaatacaagaaaaagtatccgtatccagaggggaccaggaggagagc  
atttgttacaataggaaaaataggaaatatgagacaagcacattgtaacattagtagagcaaaatggaatgcc  
actttaaaacagatagctagcaaatgaagagaacaatttggaaataataaaacaataatctttaagcaatcct  
caggaggggagccagaaattgtaacgcacagttttaattgtgagggtcaaataaacactgaagggaagtgcaca  
actgtttaatagtacttgggttaataagtacttggagtagtgaagggtcaaataaacactgaagggaagtgcaca  
atcacactcccatgcagaataaaacaattttataaacatgtggcaggaagttaggaaaagcaatgtatgccctc  
ccatcagtggaacaaattagatgttcatcaaataattactgggctgctattaacaagagatgggtggaataaaca  
caatgggtccgagatcttcagacctggaggaggcgatattgagggacaattggagaagtgaattatataaatat  
aaagtagtaaaaaattgaaccattaggagtagcaccaccaaggcaagagaagagtgggtgcagACTAGTgcag  
tggaataggagctttgttccttgggttcttgggagca

ΔCleavage site (agagaaaaaaga) → SpeI

gcaggaagcactatgggctgcacgtcaatgacgctgacggtacaggccagacaattattgtctgatatagtgc  
agcagcagaacaatttgcaggggtattgaggcgcaacagcatctgttgcaactcacagtcctggggcatcaa  
acagctccaggcaagaatcctggctgtggaagatacctaaaggatcaacagctcctggggatttgggggttgc  
tctggaaaactcatttgcaccactgctgtgccttggaatgctagttggagtaataaatctctggaacagattt  
ggaataacatgacctggatggagtgggacagagaaattaacaattacacaagcttaatacactccttaattga  
agaatcgcaaaaaccagcaagaaaagaatgaacaagaattattggaattagataaatgggcaagtttgtggaat  
tggtttaacataacaaattggctgtggtatataaaattattcataatgatagtaggaggttggtaggtttaa  
gaatagtttttgcgtgactttctatagtgaatagagtttaggcaggatattcaccattatcgtttcagacca  
cctcccaatcccaggggacccgcagggccgaagggaatagaagaagaagggtggagagagagacagagacaga  
tccattcgattagtgaacggatccttagcacttatctgggacgatctgcggagcctgtgcctcttcagctacc  
accgcttgagagacttactcttgattgtaacgaggattgtggaacttctgggacgcaggggtgggaagccct  
caaatattgggtggaatctcctacagtagttggagtcaggaactaaagaatagtgtgttaacttgcctcaatgcc  
acagccatagcagtagctgagtaa

## FIGURE 44

### DNA Sequence of Env<sup>m</sup>ΔC.T.R.N (Strain BH10) [SEQ ID NO: 21]:

Gaattctgcaacaactgctgtttatccattttcagaattgggtgtcgacat

EcoRI

agcagaataggcggtactcgacagaggagagcaagaaatggagccagtagatcctagactagagccctgga  
agcatccaggaagtcagcctaaaactgcttgtagcaattgctattgtaaaaagtgttgctttcattgcca  
gtttgtttcataacaaaagccttaggcatctcctatggcaggaagaagcggagacagcgacgaagacctcc  
tcaaggcagtcagactcatcaagtttctctatcaaagcagtaagtagtacatgtaatgcaacctatacaaa  
tagcaatagtagcattagtagtagcaataataatagcaatagttgtgtggtccatagtaatcatagaatat  
aggaaaatattaagacaaagaaaaatagacaggttaattgatagactaatagaaagagcagaagacagtgg  
caatgagagtgaaggagaaatatcagcacttggtggagatgggggtggagatggggcaccatgctccttggg  
atgttgatgatctgtagtgtctacagaaaaattgtgggtcacagtctattatgggggtacctgtgtggaagga  
agcaaccaccactctattttgtgcatcagatgctaaagcatatgatacagaggtacataatgtttgggcca  
cacatgcctgtgtacccacagaccccaaccacaagaagtagtattggtaaattgtgacagaaaaattttaac  
atgtggaaaaatgacatggttagaacagatgcattgaggtatataatcagtttatgggatcaaagcctaaagcc  
atgtgtaaaaattaacccactctgtgttagtttaagtgactgatttgaagaatgatactaataccaata  
gtagtagcgggagaatgataatggagaaaggagagataaaaaactgctctttcaatatcagcacaagcata  
agaggttaaggtgcagaaagaatatgcattttttataaaacttgatataataaccaatagataatgatactac  
cagctatacgttgacaagttgtaacacctcagtcattacacaggcctgtccaaaggtatcctttgagccaa  
ttcccatacattattgtgccccggctggttttgcgattctaaaatgtaataataagacggttcaatggaaca  
ggaccatgtacaaatgtcagcacagtacaatgtacacatggaattaggccagtagtatcaactcaactgct  
gttaaattggcagtcctggcagaagaagaggtagtaattagatctgccaatttcacagacaattgctaaaacca  
taatagtcacagctgaaccaatctgtagaatttaattgtacaagacccaacaacaatacaagaaaaagtatc  
cgtatccagagaggaccagggagagcattttgttacaataggaaaaataggaaatatgagacaagcacattg  
taacattagtagagcaaaatggaataacacttttaaacagatagatagcaaattaagagaaacaatttgga  
ataataaaacaataatctttaagcagtcctcaggaggggacccagaaattgtaacgcacagttttaattgt  
ggaggggaattttttctactgtaattcaacacaactgtttaatagtacttggtttaatagtacttgagtag  
taaaggggtcaaataacactgaaggaagtgcacaaatcacctcccatgcagaataaaacaaattataaaca  
tgtggcaggaagtaggaaaagcaatgtatgccctcccatcagtggaacaaattagatgttcatcaaatatt  
acagggctgctattaacaagagatggtggtaatagcaacaatgagtcagagatcttcagacctggaggagg  
agatatgagggacaattggagaagtgaattatataaatataaagtagtaaaaattgaaccattaggagtag  
caccaccaaggcaaagagaagagtggtgcagACTAGTgcagtggaataggagctttgttccttgggttc  
t

ΔCleavage site (agagaaaaaga)→SpeI

tgggagcagcaggaagcactatgggcgcagcgtcaatgacgctgacggtacaggccagacaattattgtct  
ggtatagtgcagcagcagaacaatttgctgagggctattgagggcgaacagcatctgttgcaactcacagt  
ctggggcatcaagcagctccaggcaagaatcctggctgtggaagatacctaaaggatcaacagctcctgg  
ggatttgggggtgctctggaaaactcatttgcaccactgctgtgccttggaaatgctagttggagtaataaa  
tctctggaacagatttggaaataacatgacctggatggagtgggacagagaaattaacaattacacaagctt  
aatacactccttaattgaagaatcgcaaaaccagcaagaaaaaatgaacaagaattattggaattagata  
aatgggcaagtttgtggaattggtttaacataacaaattggctgtggtatataaaattattcataatgata  
gtaggaggcttggtaggtttaagaatagtttttgcgtgactttctgtagtgaatagagttaggcagggata  
ttcaccattatcgtttcagacccacctccaatcccgaggggacccgacaggccgaaggaatagaagaag  
aaggtggagagagagacagagacagatccattcgattagtgaaacggatccttagcacttatctgggacgat  
ctgcggagcctgtgcctcttcagctaccaccgcttgagagacttactcttgattgtaacgaggattgtgga  
acttctgggacgcaggggggtgggaagccctcaaataattgggtggaatctcctacagtattggagtccaggagc  
taaagaatagtgtgttagcttgcctcaatgccacagctatagcagtagctgaggggacagataggggtata  
gaagtagtacaaggagcttatagagctattcgccacatacctagaagaataagacagggccttggaaggat  
tttgcataagatgggtggcaagtgggtcaaaaagtagtgtggttgatggcctgctgtaagggaagaatg  
agacgagctgagccagcagcagatgggggtgggagcagcatctcgagacctagaaaaacatggagcaatcac  
aagtagcaacacagcagctaacaatgctgattgtgcctggctagaagcacaagaggaggaggaggtgggtt  
ttccagtcacacctcaggtacctttaagaccaatgacttacaaggcagctgtagatcttagccacttttta  
aaagaaaaggggggactggaagggttaattcactcccaacgaagacaagatatccttgatctgtggatcta  
ccacacacaaggctacttcctgatttag

## FIGURE 45

### DNA Sequence of E<sup>m</sup>ΔC.N (Strain BH10) [SEQ ID NO: 22]:

Gaattcgccaccatgggagtgaggagaaatatcagcacttgtggagatgg

EcoRI Kozak NcoI

gggtggagatggggcaccatgctccttgggatgttgatgatctgtagtgtacagaaaaattgtgggtcac  
agtctattatgggtacctgtgtggaagggaagcaaccaccactctattttgtgcatcagatgctaaagcat  
atgatacagaggtacataatgtttgggccacacatgcctgtgtacccacagaccccaaccacaagaagta  
gtatttgtaaattgtacagaaaaattttaacatgtggaaaaatgacatggtagaacagatgcatgaggatat  
aatcagtttatgggatcaaagcctaaagccatgtgtaaaattaaccccactctgtgttagtttaagtga  
ctgatttgaagaatgataactaataccaatagtagtagcgggagaatgataatggagaaaggagagataaaa  
aactgctctttcaatatcagcacaagcataagaggtgaaggtgcagaaagaatatgcatttttttataaact  
tgatataataccaatagataatgatactaccagctatacgttgacaagttgtaaacacctcagtcattacac  
aggcctgtccaaaggtatcctttgagccaattcccatacattattgtgccccggctgggttttgcgattcta  
aaatgtaataataagacgttcaatggaacaggaccatgtacaaatgtcagcacagtcacatgtacacatgg  
aattaggccagtagtatcaactcaactgctgttaaattggcagtcctggcagaagaagaggtagtaattagat  
ctgccaaatttcacagacaatgctaaaaccataatagtacagctgaaccaatctgtagaatttaattgtaca  
agaccaacaacaatacaagaaaaagtatccgtatccagagaggaccagggagagcatttgttacaatagg  
aaaaataggaatatgagacaagcacattgtaacatttagtagagcaaaatggaataacacttttaaacaga  
tagatagcaaatgaagagaacaatttggaaataataaaacaataatctttaagcagtcctcaggaggggac  
ccagaaattgtaacgcacagttttaattgtggaggggaatttttctactgtaattcaacacaactgtttaa  
tagtacttgggttaatagtacttggagtactaaaggggtcaaataacactgaaggaagtgcacaaatcacc  
tcccatgcagaataaaacaaattataaacatgtggcaggaagttaggaaaagcaatgtatgccctcccatc  
agtggacaaatttagatgttcatacaatattacagggctgctattaacaagagatgggtggaatagcaacaa  
tgagtcagagatcttcagacctggaggaggagatatgagggacaattggagaagtgaattatataaatata  
aagtagtaaaaattgaaccattaggagtagcaccaccaaggcaagagaagagtggtgcagACTAGTgca  
gtgggaataggagctttgttccttgggttcttggggagc

ΔCleavage site(agagaaaaaga)→SpeI

agcaggaagcactatgggcgcagcgtcaatgacgctgacgggtacaggccagacaattattgtctgttatag  
tgcagcagcagaacaatttgcctgagggctattgaggcgcaacagcatctgttgcaactcacagtcctggggc  
atcaagcagctccaggcaagaatcctggctgtggaaagatacctaagagatcaacagctcctggggatttg  
gggttgctcttgaaaactcatttgcaccactgctgtgccttgggaatgctagttggagtaataaatctctgg  
aacagatttggaaataacatgacctggatggagtgggacagagaaattaacaattacacaagcttaatacac  
tccttaattgaagaatcgcaaaaccagcaagaaaagaatgaacaagaattattggaattagataaatgggc  
aagtttgtggaattggtttaacataacaaattggctgtggtatataaaaattattcataatgatagtaggag  
gcttggtaggtttaagaatagtttttgcctgtactttctgtagtgaatagagtttaggcagggatattcacca  
ttatcgtttcagaccacctcccaatcccaggggacccgacaggcccgaaggaatagaagaagaaggtgg  
agagagagacagagacagatccattcgatttagtgaacggatccttagcacttatctgggacgatctgcgga  
gcctgtgcctcttcagctaccaccgcttgagagacttactcttgattgtaacgaggattgtggaacttctg  
ggacgcaggggggtgggaagccctcaaatattgggtggaatctcctacagtattggagtcaggagctaaagaa  
tagtgctgttagcttgctcaatgccacagctatagcagtagctgaggggacagatagggttatagaagtag  
tacaaggagcttatagagctattcgccacatacctagaagaataagacagggttggaaaggattttgcta  
taagatgggtggcaagtggtaaaaaagtagtgtggttggatggcctgctgtaagggaagaatgagacgag  
ctgagccagcagcagatgggttgggagcagcatctcgagacctagaaaaacatggagcaatcacagtagc  
aacacagcagctaacaatgctgattgtgcttggctagaagcacaaaggaggaggaggtgggttttccagt  
cacacctcaggtacctttaagaccaatgacttacaaggcagctgtagatcttagccacttttttaaaagaaa  
aggggggactggaagggtcaattcactccaacgaagacaagatatccttgatctgtggatctaccacaca  
caaggctacttccctgattag

## FIGURE 46

### DNA Sequence of E<sup>m</sup>ΔCAT<sup>300</sup>.T (BH10) [SEQ ID NO: 23]:

Gaattctgcaacaactgctggttatccattttcagaattgggtgtcgacat

EcoRI

Agcagaataggcggttactcgacagaggagagcaagaaatggagccagtaga

Tat 1

tcc tagactagagccctggaagcatccaggaagtcagcctaaaactgcttgtagccaattgctattgtaaaa  
agtgttgctttcattgccaagtttgtttcataacaaaagccttaggcattctcctatggcaggaagaagcgg  
agacagcgacgaagacctcctcaaggcagtcagactcatcaagtttctctatcaaagcagtaagtagtaca  
tgtaatgcaacctatacaaatagcaatagtagcattagtagtagcaataataatagcaatagttgtgtggt  
ccatagtaatcatagaatataggaaaatattaagacaaaagaaaaatagacaggttaattgatagactaata  
gaaagagcagaagacagtggaatgagagtggaaggagaaatatcagcacttgtggagatgggggtggagat  
ggggcaccatgctccttgggatgttgatgatctgtagtgtacagaaaaattgtgggtcacagtctattat  
ggggtacctgtgtggaagggaagcaaccaccactctattttgtgcatcagatgctaaagcatatgatacaga  
ggtacataatgtttgggccacacatgcctgtgtacccacagaccccaaccacaagaagtagtattggtaa  
atgtgacagaaaaattttaacatgtggaaaaatgacatggtagaacagatgcatgaggatataatcagttta  
tgggatcaaagcctaaagccatgtgtaaaaattaaccccactctgtgttagtttaaagtgcactgatttgaa  
gaatgataactaataccaatagtagtagcgggagaatgataatggagaaaggagagataaaaaactgctctt  
tcaatatcagcacaagcataagaggttaaggtgcagaaagaatatgcatttttttataaaacttgatataata  
ccaatagataatgatactaccagctatacgttgacaagttgtaacacctcagtcattacacaggcctgtcc  
aaaggtatcctttgagccaattcccatacattattgtgccccggctgggttttgcgattctaaaatgtaata  
ataagacgttcaatggaacaggaccatgtacaaatgtcagcacagtacaatgtacacatggaattaggcca  
gtagtatcaactcaactgctgttaaatggcagctcggcagaagaaggtagtaattagatctgccaat  
cacagacaatgctaaaaccataatagtagcagctgaaccaatctgtagaaattaattgtacaagaccaaca  
acaatacaagaaaaagtatccgtatccagagaggaccaggagagcatttgttacaataggaaaaatagga  
aatatgagacaagcacattgtaacattagtagagcaaaatggaataacactttaaaacagatagatagcaa  
attaagagaacaatttggaaataataaaacaataatctttaagcagtcctcaggaggggacccagaaattg  
taacgcacagttttaattgtggaggggaatttttctactgtaattcaacacaactgtttaatagtacttgg  
tttaatagtacttggagtactaaagggtcaaataacactgaaggaagtgcacacacacccctcccatgcag  
aataaaacaaattataaacatgtggcaggaagtaggaaaagcaatgtatgcccctcccatcagtggaacaa  
ttagatgttcatcaaatattacagggtgctattaacaagagatggtggttaatagcaacaatgagtcagag  
atcttcagacctggaggaggagatatgagggacaattggagaagtgaattatataaatataaagtagtaaa  
aattgaaccattaggagtagcaccaccaaggcaagagaagagtggtgcagACTAGTgcagtggaatag  
gagctttgttccttgggttc

ΔCleavage site (agagaaaaaga) → SpeI

ttgggagcagcaggaagcactatgggcgagcgtcaatgacgctgacggtagcagccagacaattattgtc  
tggtatagtgcagcagcagaacaatttgcctgagggctattgagggcgcaacagcatctgttgcaactcacag  
tctggggcatcaagcagctccaggcaagaatcctggctgtggaaagatacctaaggatcaacagctcctg  
gggatttggggttgctctggaaaactcatttgcaccactgctgtgccttgggaatgctagttggagtaataa  
atctctggaacagatttggaaataacatgacctggatggagtggaagagagaaattaacaattacacaagct  
taatacactccttaattgaagaatcgcaaaaccagcaagaaaagaatgaacaagaattattggaattagat  
aaatgggcaagtttgtggaattgggttaacataacaaattggctgtggtatataaaattattcataatgat  
agtaggaggttggtaggtttaagaatagtttttgcctgtactttctgtagtgaatagagtttaggcagggat  
attcaaccattatcgtttcagaccacctcccaatcccaggggacccgacaggcccgaggaatagaagaa  
gaaggtggagagagagacagagacagatccattcgattagtgaaacggatccttagcacttatctggttaa

**Figure 47**

**DNA Sequence of E<sup>m</sup>/E<sup>m</sup> (BH10) [SEQ ID NO: 24]:**

Gaattcgccaccatgggagtgaaaggagaaatatcagcacttgtggagatgg  
EcoRI Kozak NcoI  
gggtggagatggggcaccatgctccttgggatgttgatgatctgtagtgtctacagaaaaattgtgggtcac  
agtctattatgggggtacctgtgtggaaggaagcaaccaccactctattttgtgcatcagatgctaagcat  
atgatacagaggtacataatgtttgggccacacatgcctgtgtacccacagaccccaaccacaagaagta  
gtattggtaaatgtgacagaaaaattttaacatgtggaaaaatgacatggtagaacagatgcatgaggatat  
aatcagtttatgggatcaaagcctaaagccatgtgtataaataaccccactctgtgttagtttaagtga  
ctgatttgaagaatgataactaataccaatagtagtagcggggagaatgataatggagaaaggagagataaaa  
aactgctctttcaatatcagcacaagcataagaggtgaaggtgcagaaagaatatgcattttttataaact  
tgatataataccaatagataatgatactaccagctatacgttgacaagttgtaacacctcagtcattacac  
aggcctgtccaaaggtatcctttgagccaattcccatatactattgtgccccggctggttttgcgattcta  
aaatgtaataataagacgttcaatggaacaggaccatgtacaaatgtcagcacagtacaatgtacacatgg  
aattagggcagtagtatcaactcaactgctgttaaattggcagctctggcagaagaagaggtagtaattagat  
ctgccaatttcacagacaatgctaaaaccataatagtacagctgaaccaatctgtagaaattaattgtaca  
agacccaacaacaatacaagaaaaagtatccgtatccagagaggaccagggagagcatttgttacaatagg  
aaaaataggaaatatgagacaagcacattgtaacattagtagagcaaaatggaataacactttaaaacaga  
tagatagcaaatgaagaacaatttggaaataataaaaacaataatctttaagcagtcctcaggaggggac  
ccagaaattgtaacgcacagtttttaattgtggaggggaatttttctactgtaattcaacacaactgtttaa  
tagtacttggtttaatatgtacttggagtactaaagggtcaaataacactgaaggaagtgcacaaatcccc  
tcccatgcagaataaaacaaattataaacatgtggcaggaagttaggaaaagcaatgtatgccctcccac  
agtggacaaattagatgttcatcaaataattacagggtgctattaacaagagatgggtggaatagcaacaa  
tgagtccgagatcttcagacctggaggaggagatatgagggacaattggagaagtgaattatataaatata  
aagtagtaaaaattgaaccattaggagtagcaccaccaaggcaagagaagagtggtgcagagagaaaaa  
agagcagtggggaataggagcttctgttccttgggttcttgggagcagcaggaagcactatgggcgcagcgtc  
aatgacgctgacgggtacaggccagacaattattgtctggtatagtgcagcagcagaacaatttgcagggg  
ctattgagggcgaacagcatctgttgcaactcacagtctggggcatcaagcagctccaggcaagaatcctg  
gctgtggaaagatacctaaaggatcaacagctcctggggatttgggggttgcctctggaaaactcatttgcac  
cactgctgtgccttggaatgctagttggagtaataaatctctggaacagatttgggaataacatgacctgga  
tggagtgggacagagaaattaacaattacacaagcttaatacactccttaattgaagaatcgcaaaaccag  
caagaaaagaatgaacaagaattattggaattagataaatgggcaagtttgtggaattggtttaacataac  
aaattggctgtggtatataaaaattattcataatgtagtaggaggttggtaggtttaagaatagtttttg  
ctgtactttctgtagtgaatagagtttaggcagggtatattcaccattatcgtttcagacccacctcccaatc  
ccgaggggacccgacaggcccgaaggaatagaagaagaaggtggagagagagacagagacagatccattcg  
attagtgaacggatccttagcacttatctgggacgatctgcggagcctgtgcctcttcagctaccaccgct  
tgagagacttactcttgattgtaacgaggattgtggaacttctgggacgcagggggtgggaagccctcaaa  
tattgggtggaatctcctacagtattggagtcaggagctaaagaatagtgtctgttagcttgcctcaatgccac  
agctatagcagtagctgaggggacagatagggttatagaagtagtacaaggagcttatagagctattcgcc  
acatacctagaagaataagacagggttggaaggattttgctataa

Variable	Mean	SD	Median	Mode	Range	Skewness	Kurtosis	Shapiro-Wilk	Normality
Age	35.2	12.5	32.0	30.0	20-55	0.15	2.10	0.98	Normal
Gender	1.2	0.4	1.0	1.0	1-2	0.05	0.10	0.99	Normal
Marital Status	1.5	0.5	1.0	1.0	1-3	0.10	0.20	0.99	Normal
Education	12.5	2.0	12.0	12.0	10-15	0.05	0.10	0.99	Normal
Income	1500	500	1200	1000	500-2500	0.20	1.50	0.95	Normal
Occupation	1.0	0.3	1.0	1.0	1-3	0.05	0.10	0.99	Normal
Religion	1.0	0.2	1.0	1.0	1-2	0.05	0.10	0.99	Normal
Health	1.0	0.2	1.0	1.0	1-2	0.05	0.10	0.99	Normal
Stress	2.5	1.0	2.0	2.0	1-4	0.10	0.20	0.98	Normal
Depression	1.5	0.5	1.0	1.0	1-3	0.10	0.20	0.98	Normal
Anxiety	1.5	0.5	1.0	1.0	1-3	0.10	0.20	0.98	Normal
Life Satisfaction	3.5	1.0	3.0	3.0	2-5	0.05	0.10	0.99	Normal
Work Satisfaction	3.0	1.0	2.5	2.5	2-5	0.10	0.20	0.98	Normal
Family Satisfaction	3.5	1.0	3.0	3.0	2-5	0.05	0.10	0.99	Normal
Community Satisfaction	3.0	1.0	2.5	2.5	2-5	0.10	0.20	0.98	Normal
Overall Satisfaction	3.0	1.0	2.5	2.5	2-5	0.10	0.20	0.98	Normal

Clade	ACC#	HIV-1 Strain	From(nt)	To(nt)
B	M15654	BH10	885	992
A	U09127	192UG037WHO.01083hED	888	992
C	U09126	192BR025WHO.01093hED	876	980
D	U43386	192UG024.2	888	989
E	U08458	193TH976.17	894	998
F	U27401	193BR020.17	888	992
G	U30312	192RU131.9	885	989

Tgtaccagacctaacaacaataacaagaaaaagtgtacgtataggaccagga  
caaacatttctatgcaacaggtgatataataggggatataagacaagcacat  
tgt **Clade A [SEQ ID NO: 26]**

Tgtacgagacccaacaataatacaagaaaaagtataaggataggaccagga  
caagcattctatgcaacaggagaaataataggagatatagacaagcacat  
tgt **Clade C [SEQ ID NO: 27]**

Tgcacaaggccctacaacaatatataagacaaaggacccccataggactaggg  
caagcactctatacaacaagaagaatagaagatatagaagagcacattgt  
**Clade D [SEQ ID NO: 28]**

Tgtaccagaccctccaccaatacaagaacaagtatacgtataggaccagga  
caagtattctatagaacaggagacataacaggagatatagaagaaagcatat  
tgt      **Clade E [SEQ ID NO: 29]**

Tgtacaagacccaacaacaataacaagaaaaagaatatctttaggaccagga  
cgagtatTTTtatacagcaggagaaataataggagacatcagaaaggcacat  
tgt **Clade F [SEQ ID NO: 30]**

Tgtaccagacctaataacaataacaagaaaaagtataacttttgcaccagga  
caagcgctctatgcaacaggtgaaataataggagatataagacaagcacat  
tgt **Clade G [SEQ ID NO: 31]**

## FIGURE 49A

DNA sequence of modified Env including multi-clade V3 loops [SEQ ID NO: 32]:

Atgagagtgaaggagaaatatcagcacttgtggagatgggggtggagatggggcaccatgctccttgggat  
gttgatgatctgtagtgtacagaaaaattgtgggtcacagtctattatggggtacctgtgtggaaggaag  
caaccaccactctatTTTTgtgcatcagatgctaaagcatatgatacagaggtacataatgtttgggccaca  
catgctgtgtacccacagaccccaaccacaagaagtagtatttgtaaattgtacagaaaaattttaacat  
gtggaaaaatgacatggtagaacagatgcatgaggatataatcagtttatgggatcaaagcctaaagccat  
gtgtaaaattaacccactctgtgtt**ggagctgg**tagttgtaacacctcagt

V1, V2 deletion, GAG insertion

Cattacacaggcctgtccaaaggtatcctttgagccaattcccatacattattgtgccccggctgggtttg  
cgattctaaaatgtaataataagacgttcaatggaacaggaccatgtacaaatgtcagcacagtacaatgt  
acacatggaattaggccagtagtatcaactcaactgctgttaaattggcagtctggcagaagaagaggtagt  
aattagatctgccaatttcacagacaatgctaaaaccataatgtacagctgaaccaatctgtagaaatta  
att**gt**tacaagacccaacaaca

Start of Clade B

Tacaagaaaaagtatccgtatccagagaggaccaggaggagagcatttgttacaataggaaaaataggaaata  
tgagacaagcacattgt**ctcgggtgt**taccag

Insert a *Ava*I site Clade A

Acctaacaacaatacaagaaaaagtgtacgtataggaccaggacaaacattctatgcaacaggtgatataa  
taggggatataagacaagcacattgt**gt**tac

Clade C

Gagaccaacaataatacaagaaaaagtataaggataggaccaggacaagcattctatgcaacaggagaaa  
taataggagatataagacaagcacattgt**tg**

Clade D

Cacaaggccctacaacaataataagacaaaggacccccataggactaggggcaagcactctatacaacaagaa  
gaatagaagatataagaagagcacattgt**tg**

Clade E

Taccagaccctccaccaatacaagaacaagtatacgtataggaccaggacaagtattctatagaacaggag  
acataacaggagatataagaaaaagcatattgt**ggatcctgt**tacaagacccaacaacaatacaagaaaaaga  
atatctttagg

BamHI clade F

Accaggacgagtattttatacagcaggagaaataataggagacatcagaaaggcacattgt**gt**taccagac  
ctaataacaatacaagaaaaagtataacttt

Clade G

Tgcaccaggacaagcgctctatgcaacaggtgaaataataggagatataagacaagcacattgt**ctcggga**  
acattagtagagcaaaatggaataacacttt

Insert a *Ava*I

Aaaacagatagatagcaaattaagagaacaatttggaaataataaaacaataatctttaagcagtcctcag  
gaggggacccagaaaattgtaacgcacagttttaattgtggaggggaatttttctactgtaattcaacacaa  
ctgtttaatagtacttggtttaatagtacttggagtactaaagggtaaataacactgaaggaagtgcac  
aatcaccctcccatgcagaataaaacaaattataaacatgtggcaggaagttaggaaaagcaatgtatgcc  
ctcccatcagtggaacaaattagatgttcacaaatattacagggctgctattaacaagagatgggtggaat  
agcaacaatgagtcagatcttcagacctggaggaggagatagagggacaattggagaagtgaattata  
taaataaaagtagtaaaaattgaaccattaggagtgcacccaccaaggcaagagaagagtggtgcaga  
**ctagtgcagtg**gg

Cleavage site mutation (*Spe*I)

Aataggagctttgttccttgggttcttgggagcagcaggaagcactatgggagcagcgtcaatgacgctga  
cggtacaggccagacaattattgtctggtatagtgcagcagcagaacaatttgcagggctattgaggcg  
caacagcatctgttgcaactcacagtctggggcatcaagcagctccaggcaagaatcctggctgtggaag  
atacctaaaggatcaacagctcctggggatttgggggtgctctggaactcatttgcaccactgctgtgc  
cttgggaatgctagttggagtaataatctctggaacagatttggaaataacatgacctggatggagtgggac  
agagaaattaacaattacacaagcttaatacactccttaattgaagaatcgcaaaaccagcaagaaaagaa  
tgaacaagaattattggaattagataaatgggcaagtttgggaattggtttaacataacaaattggctgt  
ggtatataaaat**ctgtgctgctgctgctcctgctcctcctcctccaggccacggatttcatgtcc**  
**ctgtga** GPI anchor

**FIGURE 49B**

**Amino acid sequence of modified Env including multi-clade V3 loops [SEQ ID NO: 33]:**

M T T A A E I V S K V G A P F T F R Y P T T G N A N G A G V L T M R N R P L T N G Q V M S E W A  
R M V S C N S G F C Q S K N V R Y P A Y T N D N G N E K N T F E W C N S T F L L I Q P T L L Y T  
V L Y D V F L A E N C L T N T P A N T N R T I N E T I W N H N G Q S E E K L T L K L W W I D I D  
K L Y A P N W G P N T A I N I N T N G N R R T T I R I N K S S E S L A G V R Q L N M E K K F  
E G G K T M D S I K H E I T G N G N E I I T G R I K G N T F D V N E Y K F Q A L G A E E W S M  
K M V A D W Q C P T G E V R K N D T I R E S D K G S D T I N W T G I I K R L A I Q I S W S A W S  
Y L P Y P K S N I F I E Q K I T I R I Q D I I R D I I L I C F I K T F Y R G R E A W W D Q S L L  
Q M V D N N L T H N R V L S G R I K G R I R R I I T R K F G N T A G R K V A Q A R G S R N L L \*  
H I W T P D K S Y G P V N I N K G S D T R I K S R F Q Q K G S L M L P V V A L Q I C N E Q W L  
L C K E Q M P V C T V I Q R M S D I I P R G A L K A A I Q E T P Y L G V Q G L Q L S K I Q N L  
W S E V E V C I A G V R S I R V I R R I A P Y G A P H D S F W C A L G K T S S H A G S N E W L  
R A A H V E V T P P S S V Q R R I Q G H G C P H G C S S F S R P T G I S T G L V K L N K F L  
W T N V Q K Q A C T A E R A I Q G A L C Q G C Q L K G Y T I P R D E A M I L E L E Y N N S  
G E T V L M L A G T Q N I G H G A P H G C V S R C A G L G C K I D M P V G V Q R I Q T E I L  
W K T W V H T C F N L F N P C P H G C Q T F C V T L N R D N G Q S G R L G A Q L Y C I S Q T S  
R L L A N E P P A V L T C G L G C Q C A R Y T F R Y I E P S S I G G D G I A Q Q T L T W L E N L  
W W F T V D L K I S L D T R G Q C A T L P R R Y P A S Q E T N I Q N N V G S Q V K T N I L W L  
G V C H T I C V L T N N R A C T F R Y S T P T N T R F I Q N N I S W A A M N W D A N H L L Q

## FIGURE 50A

### 1. DNA sequence of p17/24 in natural form [SEQ ID NO: 34]:

atgggtgcgagagcggtcagttattaagcgggggagaattagatcgatgggaaaaattcggttaaggccagg  
gggaaagaaaaaatataaattaaaacatatagtagtggaagcagggagctagaacgattcgagttaatc  
ctggcctgttagaaacatcagaaggctgtagacaaatactgggacagctacaaccatcccttcagacagga  
tcagaagaacttagatcattatataatacagtagcaaccctctattgtgtgcatcaaaggatagagataaa  
agacaccaaggaagcttttagacaagatagaggaagagcaaaacaaaagtaagaaaaaagcacagcaagcag  
cagctgacacaggacacagcagtcaggtcagccaaaattaccctatagtgagaacatccaggggcaaagt  
gtacatcaggccatcacctagaacttttaaatgcatgggtaaaagtagtagaagagaaggctttcagccc  
agaagtaatacccatgttttcagcattatcagaaggagccaccccacaagattttaaacaccatgctaaca  
cagtggggggacatcaagcagccatgcaaattgttaaaagagaccatcaatgaggaagctgcagaatggg  
agagtacatccagtgcagtgaggccctattgcaccaggccagatgagagaaccaaggggaagtgcatagc  
aggaactactagtacccttcaggaacaaataggatggatgacaaataatccacctatccagtaggagaaa  
tttataaaagatggataatcctgggattaaataaaaatagtaagaatgtatagccctaccagcattctggac  
ataagacaaggacccaaaagaaccttttagagactatgtagaccggttctataaaactctaagagccgagca  
agcttcacaggaggttaaaaaattggatgacagaaacctgttgggtccaaaatgcgaaccagattgtaaga  
ctatttttaaagcattgggaccagcggtacactagaagaatgatgacagcatgtcagggagtaggagga  
cccggccataaggcaagagttttgtaa

### 2. DNA sequence of p17/24 in secreted form [SEQ ID NO: 35]:

atgagagtgaaggagaaatatcagcacttgtggagatgggggtggagatgg  
gp120 signal peptide  
ggcaccatgctccttgggatgttgatgatctgtagtgctggtgcgagagcg  
p17/p24

tcagtattaagcgggggagaattagatcgatgggaaaaattcggttaaggccagggggaaagaaaaata  
taaattaaaacatatagtagtggaagcagggagctagaacgattcgagttaatcctggcctgttagaaa  
catcagaaggctgtagacaaatactgggacagctacaaccatcccttcagacaggatcagaagaacttaga  
tcattatataatacagtagcaaccctctattgtgtgcatcaaaggatagagataaaagacaccaaggaagc  
tttagacaagatagaggaagagcaaaacaaaagtaagaaaaaagcacagcaagcagcagctgacacaggac  
acagcagtcaggtcagccaaaattaccctatagtgagaacatccaggggcaaagtgtacatcaggccata  
tcacctagaacttttaaatgcatgggtaaaagtagtagaagagaaggctttcagcccagaagtaatacccat  
gttttcagcattatcagaaggagccaccccacaagattttaaacaccatgctaacaacagtggggggacatc  
aagcagccatgcaaattgttaaaagagaccatcaatgaggaagctgcagaatgggatagagtacatccagt  
catgcaggccctattgcaccaggccagatgagagaaccaaggggaagtgcatagcaggaactactagtac  
ccttcaggaacaaataggatggatgacaaataatccacctatccagtaggagaaatttataaaagatgga  
taatcctgggattaaataaaaatagtaagaatgtatagccctaccagcattctggacataagacaaggacca  
aaagaaccttttagagactatgtagaccggttctataaaaactctaagagccgagcaagcttcacaggaggt  
aaaaaattggatgacagaaaccttgttgggtccaaaatgcgaaccagattgtaagactatttttaaagcat  
tggaaccagcggtacactagaagaatgatgacagcatgtcagggagtaggaggacccggccataaggca  
agagttttgtaa

gp41 transmembrane domain

[illegible]

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	G	A	R	A	S	V
L	S	G	G	E	L	D	R	W	E	K	I	R	L	R	P	G	G
K	K	K	Y	K	L	K	H	I	V	W	A	S	R	E	L	E	R
F	A	V	N	P	G	L	L	E	T	S	E	G	C	R	Q	I	L
G	Q	L	Q	P	S	L	Q	T	G	S	E	E	L	R	S	L	Y
N	T	V	A	T	L	Y	C	V	H	Q	R	I	E	I	K	D	T
K	E	A	A	D	K	I	E	E	E	Q	N	K	S	K	K	Y	A
Q	Q	A	A	A	D	T	G	H	S	S	Q	V	S	Q	N	Y	P
Q	Q	A	A	A	D	T	G	H	S	S	Q	V	S	Q	N	Y	P
I	V	Q	N	I	Q	G	Q	M	V	H	Q	A	I	S	P	R	T
L	N	A	W	V	K	V	V	E	E	K	A	F	S	P	E	V	I
P	M	F	S	A	L	S	E	G	A	A	P	Q	M	L	K	T	M
L	N	T	V	G	G	H	Q	A	A	M	Q	M	L	K	E	T	I
N	E	E	A	A	E	W	D	R	V	H	P	V	H	A	G	P	I
A	P	G	Q	M	R	E	P	R	G	S	D	I	A	G	T	T	S
T	L	Q	E	Q	I	G	W	M	T	N	N	P	P	I	P	V	G
E	I	Y	S	R	I	D	I	L	R	G	L	K	E	I	V	M	Y
S	V	D	R	F	Y	K	T	L	R	A	E	Q	A	S	Q	R	D
T	I	L	K	A	L	G	P	A	A	T	L	E	E	M	M	T	V
C	Q	G	V	G	G	P	G	H	K	A	R	V	L	*		A	A

Variable	Mean	SD	Min	Max
Age	34.5	10.2	21	55
Gender	Male			
Female				
Marital status	Married			
Single				
Divorced				
Widowed				
Education	High school			
College				
Postgraduate				
Occupation	Manager			
Teacher				
Engineer				
Doctor				
Lawyer				
Artist				
Writer				
Other				
Income	Low			
Medium				
High				
Religion	Islam			
Christianity				
Judaism				
Hinduism				
Buddhism				
Sikhism				
Other				
Health status	Good			
Fair				
Poor				
Very poor				
Smoking status	Smoker			
Non-smoker				
Alcohol consumption	Regular			
Occasional				
Never				
Exercise frequency	High			
Medium				
Low				
Stress level	High			
Medium				
Low				
Sleep quality	Good			
Fair				
Poor				
Appetite	Good			
Fair				
Poor				
Weight change	Gain			
Stable				
Loss				
Energy level	High			
Medium				
Low				
Motivation	High			
Medium				
Low				
Life satisfaction	High			
Medium				
Low				
Overall health	Good			
Fair				
Poor				
Very poor				

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	G	A	R	A	S	V
L	S	G	G	E	L	D	R	W	E	K	I	R	L	R	P	G	G
K	S	G	G	E	L	D	R	W	E	K	I	R	L	R	P	G	G
F	K	V	Y	K	L	K	H	I	V	W	A	R	R	R	P	G	G
G	A	L	N	P	L	L	I	E	T	S	E	S	C	R	Q	E	I
N	Q	A	Q	T	S	L	Q	T	G	W	E	E	E	R	S	I	L
K	T	V	A	P	K	I	C	V	H	S	R	I	S	I	K	D	Y
Q	Q	A	A	D	Q	I	E	H	S	Q	N	K	S	R	K	K	T
I	V	Q	A	A	K	T	G	M	V	S	Q	V	I	Q	N	Y	A
L	N	F	A	I	L	V	Q	E	E	H	A	A	S	S	P	R	P
P	M	A	F	V	K	S	V	G	A	K	P	Q	D	S	E	V	T
L	N	T	E	A	G	H	W	A	A	T	Q	M	L	P	N	T	I
N	E	E	G	G	E	W	Q	R	V	M	P	V	H	A	E	P	I
A	P	G	Q	Q	R	E	P	M	T	S	D	I	A	P	T	V	S
T	L	Y	Y	R	I	I	W	L	G	N	N	P	P	I	P	M	G
E	I	D	T	F	W	D	I	R	Q	L	P	K	I	V	R	R	Y
S	P	W	S	T	L	K	I	L	R	G	E	Q	E	P	Q	E	D
Y	V	L	R	A	E	T	T	L	V	A	N	A	A	S	D	C	V
K	Q	G	K	G	G	P	P	A	K	T	R	V	E	M	M	I	K
T	V	V	T	G	V	G	S	H	I	A	F	A	N	P	F	V	A
C	R	G	G	E	L	P	S	R	L	V	A	E	L	L	S	V	M
I	R	G	N	Q	G	Y	S	P	I	S	F	Q	V	H	L	P	V
N	R	G	*	Q	G	Y	S	P	L	S	F	Q	T				I

## FIGURE 51A

### 1. DNA sequence of p17 in natural form [SEQ ID NO: 40]:

atgggtgcgagagcgtcagtattaagcgggggagaattagatcgatgggaaaaaattcg  
gttaaggccagggggaaagaaaaaatataaattaaaacatatagtatgggcaagcagg  
agctagaacgattcgcagttaatcctggcctggttagaaacatcagaaggctgtagacaa  
atactgggacagctacaacctccttcagacaggatcagaagaacttagatcattata  
taatacagtagcaacctctattgtgtgcatcaaaggatagagataaaagacaccaagg  
aagcttttagacaagatagaggaagagcaaaacaaaagtaagaaaaaagcacagcaagca  
gcagctgacacaggacacagcagtcagggtcagccaaaattactaa

### 2. DNA sequence of p17 in secreted form [SEQ ID NO: 41]:

atgagagtgaaggagaaatatcagcacttgtggagatgggggtggagatgg  
gp120 signal peptide  
ggcaccatgctccttgggatggtgatgatctgtagtgctggtgcgagagcg  
p17  
tcagtattaagcgggggagaattagatcgatgggaaaaaattcggttaaggccaggggg  
aaagaaaaaatataaattaaaacatatagtatgggcaagcaggagctagaacgattcg  
cagttaatcctggcctggttagaaacatcagaaggctgtagacaaatactgggacagcta  
caacctcccttcagacaggatcagaagaacttagatcattatataatacagtagcaac  
cctctattgtgtgcatcaaaggatagagataaaagacaccaaggaagcttttagacaaga  
tagaggaagagcaaaacaaaagtaagaaaaaagcacagcaagcagcagctgacacagga  
cacagcagtcagggtcagccaaaattactaa

### 3. DNA sequence of p17 in membrane bound form [SEQ ID NO: 42]:

atgagagtgaaggagaaatatcagcacttgtggagatgggggtggagatgg  
gp120 signal peptide  
ggcaccatgctccttgggatggtgatgatctgtagtgctggtgcgagagcg  
p17  
tcagtattaagcgggggagaattagatcgatgggaaaaaattcggttaaggccaggggg  
aaagaaaaaatataaattaaaacatatagtatgggcaagcaggagctagaacgattcg  
cagttaatcctggcctggttagaaacatcagaaggctgtagacaaatactgggacagcta  
caacctcccttcagacaggatcagaagaacttagatcattatataatacagtagcaac  
cctctattgtgtgcatcaaaggatagagataaaagacaccaaggaagcttttagacaaga  
tagaggaagagcaaaacaaaagtaagaaaaaagcacagcaagcagcagctgacacagga  
cacagcagtcagggtcagccaaaattac  
ttattcataatgatagtaggaggcttggttaggtttaagaatagtttttgctgtactttc  
tgtagtgaatagagtttaggcagggatattcaccattatcgtttcagacccacctcccaa  
tcccgaggggataa  
gp41 transmembrane domain

FIGURE 51B

**1. Amino acid sequence of p17 in natural form [SEQ ID NO: 43]:**

M	G	A	R	A	S	V	L	S	G	G	E	L	D	R	W	E	K
I	R	L	R	P	G	G	K	K	K	Y	K	L	K	H	I	V	W
A	S	R	E	L	E	R	F	A	V	N	P	G	L	L	E	T	S
E	G	C	R	Q	I	L	G	Q	L	Q	P	S	L	Q	T	G	S
E	E	L	R	S	L	Y	N	T	V	A	T	L	Y	C	V	H	Q
R	I	E	I	K	D	T	K	E	A	L	D	K	I	E	E	E	Q
N	K	S	K	K	K	A	Q	Q	A	A	A	D	T	G	H	S	S
Q	V	S	Q	N	Y	*											

**2. Amino acid sequence of p17 in secreted form [SEQ ID NO: 44]:**

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	G	A	R	A	S	V
L	S	G	G	E	L	D	R	W	E	K	I	R	L	R	P	G	G
K	K	K	Y	K	L	K	H	I	V	W	A	S	R	E	L	E	R
F	A	V	N	P	G	L	L	E	T	S	E	G	C	R	Q	I	L
G	Q	L	Q	P	S	L	Q	T	G	S	E	E	L	R	S	L	Y
G	Q	L	Q	P	S	L	Q	T	G	S	E	E	L	R	S	L	Y
N	T	V	A	T	L	Y	C	V	H	Q	R	I	E	I	K	D	T
K	E	A	L	D	K	I	E	E	E	Q	N	K	S	K	K	K	A
Q	Q	A	A	A	D	T	G	H	S	S	Q	V	S	Q	N	Y	*

**3. Amino acid sequence of p17 in membrane bound form [SEQ ID NO: 45]:**

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	G	A	R	A	S	V
L	S	G	G	E	L	D	R	W	E	K	I	R	L	R	P	G	G
K	K	K	Y	K	L	K	H	I	V	W	A	S	R	E	L	E	R
G	Q	L	Q	P	S	L	Q	T	G	S	E	E	L	R	S	L	Y
N	T	V	A	T	L	Y	C	V	H	Q	R	I	E	I	K	D	T
K	E	A	L	D	K	I	E	E	E	Q	N	K	S	K	K	K	A
Q	Q	A	A	A	D	T	G	H	S	S	Q	V	S	Q	N	Y	L
F	I	M	I	V	G	R	L	V	G	L	R	I	V	F	A	V	L
S	V	V	N	R	V	G	Q	G	Y	S	P	L	S	F	Q	T	H
L	P	I	P	R	G	*											

**FIGURE 52B**

**1. Amino acid sequence of p24 in natural form [SEQ ID NO: 49]:**

M	P	I	V	Q	N	I	Q	G	Q	M	V	H	Q	A	I	S	P	P
R	T	L	N	A	W	V	K	V	V	E	E	K	A	F	S	P	L	E
V	I	P	M	F	S	A	L	S	E	G	A	T	P	Q	D	L	K	N
T	M	L	N	T	V	G	G	H	Q	A	A	M	Q	M	L	H	A	E
T	I	N	E	E	A	A	E	W	D	R	V	H	P	V	A	G	T	P
P	I	A	P	G	Q	M	R	E	P	R	G	S	D	I	A	G	I	R
T	S	T	L	Q	E	Q	I	G	W	M	T	N	N	P	P	I	V	P
V	G	E	I	Y	K	R	W	I	I	L	G	L	N	K	E	P	S	Q
M	Y	S	P	T	S	I	L	D	I	R	Q	G	P	K	A	S	P	D
R	D	Y	V	D	R	F	Y	K	T	L	R	A	E	Q	A	P	Q	M
E	V	K	N	W	M	T	E	T	L	L	V	Q	N	A	N	P	D	M
C	K	T	I	L	K	A	L	G	P	A	A	T	L	E	E	*		
T	A	C	Q	G	V	G	G	P	G	H	K	A	R	V	L			

**2. Amino acid sequence of p24 in secreted form [SEQ ID NO: 50]:**

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	P	I	V	Q	N	I
Q	G	Q	M	V	H	Q	A	I	S	P	R	T	L	N	A	W	V
K	V	V	E	E	K	A	F	S	P	E	V	I	P	M	F	S	A
L	S	E	G	A	T	P	Q	D	L	N	T	M	L	N	T	V	G
G	H	Q	A	A	M	Q	M	L	K	E	T	I	N	E	E	A	A
E	W	D	R	V	H	P	V	H	A	G	P	I	A	P	Q	Q	M
R	E	P	R	G	S	D	I	A	G	T	T	S	T	L	Y	E	Q
I	G	W	M	T	N	N	P	P	I	P	V	G	E	I	K	R	I
W	I	I	L	G	L	N	K	I	V	R	M	Y	S	P	S	F	T
L	D	I	R	Q	G	P	K	E	P	F	R	D	Y	V	D	M	A
Y	K	T	L	R	A	E	Q	A	S	Q	E	V	K	N	W	K	T
E	T	L	L	V	Q	N	A	N	P	D	C	K	T	I	L	V	A
L	G	P	A	A	T	L	E	E	M	M	T	A	C	Q	G		G
G	P	G	H	K	A	R	V	L	*								

**3. Amino acid sequence of p24 in secreted form [SEQ ID NO: 51]:**

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	P	I	V	Q	N	I
Q	G	Q	M	V	H	Q	A	I	S	P	R	T	L	N	A	W	V
K	V	V	E	E	K	A	F	S	P	E	V	I	P	M	F	S	A
L	S	E	G	A	T	P	Q	D	L	N	T	M	L	N	T	V	G
G	H	Q	A	A	M	Q	M	L	K	E	T	I	N	E	E	A	A
R	E	P	R	G	S	D	I	A	G	T	T	S	T	L	Y	Q	M
I	G	W	M	T	N	N	P	P	I	P	V	G	E	I	K	R	I
W	I	I	L	G	L	N	K	I	V	R	M	Y	S	P	D	S	F
L	D	I	R	Q	G	P	K	E	P	F	R	D	Y	V	W	M	A
Y	K	T	L	R	A	E	Q	A	S	Q	E	V	K	N	L	K	T
E	T	L	L	V	Q	N	A	N	P	D	C	A	T	I	G	V	G
L	G	P	A	A	T	L	E	E	M	M	T	M	C	Q	G		L
G	P	G	H	K	A	R	V	L	L	F	I	V	I	V	G		Q
V	Y	S	P	L	S	F	Q	T	H	L	P	I	P	R		*	

## FIGURE 53A

DNA sequence of modified Env including multi-clade V3 loops and Tat  
[SEQ ID NO: 52]:

Gaattctgcaacaactgctgtttatccattttcagaattgggtgtcgacatagcagaataggcgt  
tactcgacagaggagagcaagaa**atgg**agccagtagatcctagactagagccc

### Tat1

Tggaagcatccaggaagtcagcctaaaactgcttgtagcaattgctattgtaaaaagtgttgctt  
tcattgccaagtttgtttcatacaaaaagccttaggcattctcctatggcaggaagaagcggagac  
agcgacgaagacctcctcaaggcagtcagactcatcaagtttctctatcaaagcagtaagtagta  
catgtaatgcaacctatacaaatagcaatagtagcattagtagtagcaataataatagcaatagt  
tgtgtggtccatagtaatcatagaatataggaaaatattaagacaaaagaaaaatagacaggttaa  
ttgatagactaatagaaagagcagaagacagtggca**atg**agagtgaaggagaaatatcagcactt  
gtggagatgggggtggagatggg

### Envelope

Gcaccatgctccttgggatgttgatgatctgtagtgctacagaaaaattgtgggtcacagtctat  
tatggggtagctgtgtggaaggaagcaaccaccactctattttgtgcatcagatgctaaagcata  
tgatacagaggtacataatgtttgggccacacatgctgtgtacccacagaccccaaccacaag  
aagtagtatttggtaaatgtgacagaaaaattttaacatgtggaaaaatgacatggtagaacagatg  
catgaggatataatcagtttatgggatcaaagcctaagccatgtgtaaaattaaccccactctg  
tgtt**ggagctgg**tagttgtaacacctca

Delete V1V2, insert Gly,Ala,Gly

gtcattacacaggcctgtccaaaggtatcctttgagccaattcccatacattattgtgccccggc  
tggtttttgcgattctaaaatgtaataataagacgttcaatggaacaggaccatgtacaaatgtca  
gcacagtacaatgtacacatggaattaggccagtagtatcaactcaactgctgttaaattggcagt  
ctggcagaagaagaggtagtaattagatctgccaatttcacagacaatgctaaaaccataatagt  
acagctgaaccaatctgtagaattaatt**gt**tacaag

### First multi-clade repeat

Acccaacaacaatatacaagaaaaagtatccgtatccagagaggaccagggagagcatttgttaca  
taggaaaaataggaaatatgagacaagcacattgtctcggtgtaccagacctaaacaacaatata  
agaaaaagtgtacgtataggaccaggacaaacattctatgcaacaggtgatataataggggatat  
aagacaagcacattgttgtacgagaccaacaataatacaagaaaaagtataaggataggaccag  
gacaagcattctatgcaacaggagaaataataggagatataagacaagcacattgttgcacaagg  
ccctacaacaatataagacaaaggacccccataggactagggaagcactctatacaacaagaag  
aatagaagatataagaagagcacattgttgtaccagacctccaccaataacaagaacaagtatac  
gtataggaccaggacaagtattctatagaacaggagacataacaggagatataagaaaagcatat  
tgtggatcctgtacaagacccaacaacaatacaagaaaaagaatatctttaggaccaggacgagt  
atattatcacagcaggagaaataataggagacatcagaaaggcacattgttgtaccagacctata  
acaatacaagaaaaagtataacttttgcaccaggacaagcgctctatgcaacaggtgaaataata  
ggagatataagacaagcacattgtctcggt**gt**taccagacctaaacaacaata

### Second multi-clade repeat

Caagaaaaagtgtacgtataggaccaggacaaacattctatgcaacaggtgatataataggggat  
ataagacaagcacattgttgtacgagaccaacaataatacaagaaaaagtataaggataggacc  
aggacaagcattctatgcaacaggagaaataataggagatataagacaagcacattgttgcaca  
ggccctacaacaatataagacaaaggacccccataggactagggaagcactctatacaacaaga  
agaatagaagatataagaagagcacattgttgtaccagacctccaccaataacaagaacaagtat  
acgtataggaccaggacaagtattctatagaacaggagacataacaggagatataagaaaagcat  
attgtggatcctgtacaagacccaacaacaatacaagaaaaagaatatctttaggaccaggacga  
gtattttatcacagcaggagaaataataggagacatcagaaaggcacattgttgtaccagacctaa  
taacaatacaagaaaaagtataacttttgcaccaggacaagcgctctatgcaacaggtgaaataa

Variable	Mean	SD	Min	Max
Age	34.5	10.2	20	55
Gender	0.5	0.5	0	1
Marital status	0.6	0.5	0	1
Education	12.5	1.5	9	16
Income	1500	500	500	3000
Health status	0.8	0.2	0	1
Smoking status	0.3	0.5	0	1
Alcohol consumption	0.2	0.4	0	1
Exercise frequency	0.5	0.5	0	1
Stress level	0.7	0.3	0	1
Sleep quality	0.6	0.4	0	1
Work satisfaction	0.5	0.5	0	1
Life satisfaction	0.6	0.4	0	1
Overall health	0.7	0.3	0	1
Physical activity	0.4	0.5	0	1
Mental health	0.6	0.4	0	1
Social support	0.5	0.5	0	1
Work-life balance	0.5	0.5	0	1
Financial stability	0.6	0.4	0	1
Family harmony	0.7	0.3	0	1
Personal growth	0.6	0.4	0	1
Community involvement	0.5	0.5	0	1
Life goals achievement	0.6	0.4	0	1
Overall well-being	0.7	0.3	0	1

AvaI site, end of two multi-clade repeat

Aaaacagatagatagcaaattaagagaacaatttggaaataataaaacaataatctttaagcagt  
cctcaggaggggaccagaaattgtaacgcacagttttaattgtggagggaatttttctactgt  
aattcaacacaactgtttaatagtacttggtttaatagtacttggagtactaaagggtcaaataa  
cactgaagggaagtgcacaatcacccctcccatgcagaataaaacaaattataaacatgtggcagg  
aagtaggaaaagcaatgtatgccctcccatcagtggaacaaattagatgttcatcaaattattaca  
gggctgctattaacaagagatggtggtaatagcaacaatgagtcgagatcttcagacctggagg  
aggagatatgagggacaattggagaagtgaattatataaatataaagtagtaaaaattgaaccat  
taggagtagcaccaccaaggcaaagagaagagtgggtgcagactagtgcagtgggaataggagct  
ttgttccttgg

AvaI site, end of two multi-clade repeat

Aaaacagatagatagcaaattaagagaacaatttggaaataataaaaacaataatctttaagcagt  
cctcaggaggggaccagaaattgtaacgcacagttttaattgtggagggaatttttctactgt  
aattcaacacaactgtttaatagtacttggtttaatagtacttggagtactaaaggggtcaaataa  
cactgaagggaagtgcacaatcacccctcccatgcagaataaaacaaattataaacatgtggcagg  
aagtaggaaaagcaatgtatgccctcccatcagtggaacaaattagatgttcacaaatattaca  
gggctgctattaacaagagatggtggtaatagcaacaatgagtcaggagatcttcagacctggagg  
aggagatatgagggacaattggagaagtgaattatataaatataaagtagtaaaaattgaaccat  
taggagtagcaccaccaaggcaaagagaagagtgggtgcagactagtgcagtggaataggagct  
ttgttccttgg

Delete the cleavage site, insert SpeI site

gttccttgggagcagcaggaagcactatgggcgcagcgtcaatgacgctgacggtacaggccagac  
aattattgtctggtatagtgcagcagcagaacaatttgctgagggctattgaggcgcaacagcat  
ctgttgcaactcacagtctggggcatcaagcagctccaggcaagaatcctggctgtggaagata  
cctaaaggatcaacagctcctggggatttggttgctctggaaaactcatttgcaccactgctg  
tgccttggaatgctagttggagtaataaatctctggaacagatttggaataacatgacctggatg  
gagtgggacagagaaattaacaattacacaagcttaatacactccttaattgaagaatcgcaaaa  
ccagcaagaaaagaatgaacaagaattattggaattagataaatgggcaagtttggtggaattggt  
ttaacataacaaattggctgtggtatataaaattattcataatgatagtaggaggcttggtaggt  
ttaagaatagtttttgctgtactttctgtagtgtaatagagtttaggcagggatattcaccattatc  
gtttcagacccacctccaatcccgaggggacccgcagggcccgaaggaatagaagaagaaggtg  
gagagagagacagagacagatccattcgattagtgaacggatccttagcacttatctggttaa

gp41, delete the 300 bp at C-terminal



## FIGURE 54A

DNA sequence of modified Env including multi-clade V3 loops, Tat and Rev  
[SEQ ID NO: 54]:

gaattctgcaacaactgctgtttatccattttcagaattgggtgtcgacatagcagaat  
aggcgttactcgacagaggagagcaagaa**atgg**agccagtagatcctagactagagccc

Tat1

tggaagcatccaggaagtcagcctaaaactgcttgtagccaattgctattgtaaaaagtg  
ttgctttcattgccaagtttgtttcataacaaaagccttaggcattctcct**atgg**cagga

Rev1

agaagcggagacagcgcgaagacctcctcaaggcagtcagactcatcaagtttctcta  
tcaaagcagtaagtagtacatgtaatgcaacctatacaaatagcaatagtagcattagt  
agtagcaataataatagcaatagttgtgtggtccatagtaatcatagaatataggaaaa  
tattaagacaaaagaaaaatagacagggttaattgatagactaatagaaagagcagaagac  
agtggca**atgg**agagtgaaggagaaatatcagcacttgtggagatgggggtggagatggg

Envelope

Gcaccatgctccttgggatgttgatgatctgtagtgctacagaaaaattgtgggtcaca  
gtctattatgggggtacctgtgtggaaggaagcaaccaccactctattttgtgcatcaga  
tgctaaagcatatgatacagaggtacataatgtttgggccacacatgcctgtgtacca  
cagaccccaaccacagaagtagtattggtaaatgtgacagaaaattttaacatgttg  
aaaaatgacatggtagaacagatgcatgaggatataatcagtttatgggatcaaagcct  
aaagccatgtgtaaaattaacccactctgtgtt**ggagctggg**tagttgtaacacctca

Delete V1V2, insert Gly,ala,gly

gtcattacacaggcctgtccaaaggtatcctttgagccaattcccatacattattgtgc  
cccggctggttttgcgattctaaaatgtaataataagacggtcaatggaacaggaccat  
gtacaaatgtcagcacagtacaatgtacacatggaattaggccagtagtatcaactcaa  
ctgctgtttaaattggcagctctggcagaagaagaggtagtaattagatctgccaatctc  
agacaatgctaaaaccataatagtagcagctgaaccaatctgtagaattaat**tg**tacaa  
g

First multi-clades repeat

Acccaacaacaatacaagaaaaagtatccgtatccagagaggaccagggagagcatttg  
ttacaataggaaaaataggaaatatgagacaagcacattgtctcgggtgtaccagacct  
aacaacaatacaagaaaaagtgtagctataggaccaggacaaacattctatgcaacagg  
tgatataataggggatataagacaagcacattgttgtagcagacccaacaataatacaa  
gaaaaagtataaggataggaccaggacaagcattctatgcaacaggagaaataatagga  
gatataagacaagcacattgttgacaaaggccctacaacaataataagacaaaggacccc  
cataggactagggcaagcactctatacaacaagaagaatagaagatataagaagagcac  
attgttgtagcagacctccaccaatacaagaacaagtatacgtataggaccaggacaa  
gtattctatagaacaggagacataacaggagatataagaaaagcatattgtggatcctg  
tacaagaccaacaacaatacaagaaaaagaatatctttaggaccaggacgagtatttt  
atacagcaggagaaataataggagacatcagaaaggcacattgttgtagcagacctaat  
aacaatacaagaaaaaggtataacttttgaccaggacaagcgctctatgcaacagggtga  
aataataggagatataagacaagcacattgtt**cctcgggtgt**accagacctaacacaata

Second multi-clade repeat

caagaaaaagtgtagctataggaccaggacaaacattctatgcaacagggtgatataata  
ggggatataagacaagcacattgttgtagcagacccaacaataatacaagaaaaagtat

Variable	Mean	SD	Min	Max
Age	34.5	10.5	20	55
Gender	0.5	0.5	0	1
Marital status	0.5	0.5	0	1
Education	12.5	1.5	10	15
Income	15.5	5.5	10	25
Health status	1.5	0.5	1	2
Stress level	2.5	1.5	1	4
Life satisfaction	3.5	1.5	1	5
Work satisfaction	3.5	1.5	1	5
Family satisfaction	3.5	1.5	1	5
Community satisfaction	3.5	1.5	1	5
Overall satisfaction	3.5	1.5	1	5

AvaI site, end of two multi-clade repeat

Delete the cleavage site, insert SpeI

gp41, but 99 bp truncation at C-terminal

**FIGURE 54B**

**Amino acid sequence of modified Env including multi-clade V3 loops, Tat and Rev**

**[SEQ ID NO: 55]:**

M	R	V	K	E	K	Y	Q	H	L	W	R	W	G	W	R	W	G
T	M	L	L	G	M	L	M	I	C	S	A	T	E	K	L	W	V
T	V	D	Y	G	V	P	V	W	K	E	H	T	T	W	L	F	C
A	S	Y	A	K	A	Y	D	T	E	V	A	N	V	L	A	T	H
A	C	V	P	T	D	P	N	P	Q	E	V	V	L	V	N	V	T
E	N	F	N	M	W	K	N	D	M	V	E	Q	M	H	E	D	I
I	S	L	W	D	Q	S	L	K	P	C	V	K	L	T	P	L	C
V	G	A	G	S	C	N	T	S	V	I	T	Q	A	C	P	K	V
S	F	E	P	I	P	I	H	Y	C	A	P	A	G	F	A	I	L
K	C	N	N	K	T	F	N	G	T	V	S	C	T	N	V	L	T
V	Q	C	T	H	G	I	V	P	V	V	R	S	A	N	F	L	N
G	S	L	A	E	E	E	L	N	Q	S	V	E	I	N	C	T	N
A	K	T	I	I	V	Q	L	N	R	I	Q	R	G	P	G	R	A
P	N	N	N	T	R	K	S	I	R	I	Q	R	A	H	C	G	C
F	V	T	I	G	K	I	G	N	M	R	Q	A	G	C	L	G	A
T	R	P	N	N	N	T	R	K	S	V	R	I	G	P	G	Q	C
F	Y	A	N	G	D	I	I	G	D	I	R	Q	A	H	C	C	A
R	P	T	N	E	I	I	K	S	I	R	I	G	L	C	Q	C	T
Y	A	N	N	I	R	Q	R	D	I	P	I	G	L	C	Q	A	R
P	Y	N	R	I	E	D	I	R	R	A	H	C	C	T	F	Y	P
T	T	R	R	T	S	I	R	I	G	P	G	Q	V	F	R	R	S
T	N	T	R	T	D	I	R	K	A	Y	C	G	S	C	T	F	T
G	D	I	T	G	D	I	I	R	L	G	P	G	R	V	T	Y	P
N	N	E	I	I	K	G	D	I	R	K	A	H	C	C	L	Y	A
A	N	T	R	K	S	I	T	F	A	P	G	Q	A	L	T	F	P
N	E	I	I	G	D	I	R	Q	A	H	C	L	G	C	T	F	A
G	N	N	T	R	K	S	V	R	I	G	P	G	Q	C	T	R	N
N	T	D	I	I	G	S	D	I	R	Q	A	H	C	C	T	F	P
G	N	E	I	I	G	D	I	R	I	G	A	H	C	C	T	R	N
N	I	R	Q	R	T	P	I	Q	L	G	C	Q	A	L	Y	T	T
R	I	E	D	I	R	R	A	H	C	C	T	R	P	S	T	N	T
R	T	S	I	R	I	G	P	G	Q	V	F	Y	R	T	G	D	I
T	G	D	I	R	K	A	Y	C	G	S	C	T	R	P	N	N	E
T	R	K	I	R	S	G	A	P	H	C	R	V	F	Y	T	A	N
I	K	S	I	T	F	A	P	G	Q	A	L	Y	A	T	N	G	E
I	G	D	I	R	Q	A	H	C	L	G	N	I	S	R	A	K	W
N	N	T	L	K	Q	I	D	S	K	L	R	E	Q	F	G	N	N
K	T	I	I	F	K	Q	S	S	G	G	D	P	E	I	V	T	H
S	F	N	C	G	G	E	F	F	Y	C	N	S	T	Q	L	F	N
S	D	W	F	N	S	T	W	S	T	K	G	S	N	N	T	E	G
S	V	T	I	A	M	Y	A	P	I	I	S	I	Q	I	N	W	Q
S	N	I	T	G	L	L	L	T	P	D	G	G	N	S	N	C	S
S	E	I	F	R	P	G	G	G	I	E	M	D	N	W	R	S	E
L	Y	K	Y	K	V	V	Q	I	E	P	L	G	V	A	P	T	K
A	K	R	R	V	V	T	S	S	A	V	G	I	S	M	L	F	L
G	Q	L	G	A	A	L	L	S	D	I	V	Q	Q	N	N	L	T
V	Q	A	I	Q	Q	Q	H	L	L	Q	Q	T	V	W	G	I	K
R	L	Q	I	A	R	I	A	V	E	R	Y	L	K	D	Q	Q	L
Q	G	I	W	G	C	S	G	K	L	I	C	T	T	A	V	P	W
L	A	S	W	R	N	I	S	N	E	Y	I	W	N	H	M	T	L
N	E	S	Q	N	Q	Q	E	K	N	E	Q	E	L	L	E	L	D
E	W	A	S	L	W	N	W	F	N	I	T	E	W	L	W	Y	I
K	L	F	I	M	I	V	G	G	L	V	G	L	R	I	V	F	A
K	L	S	I	V	N	R	V	R	Q	G	Y	S	P	L	S	E	Q
T	H	L	P	I	P	R	G	P	D	R	P	E	G	I	E	E	E
G	I	E	R	D	D	R	R	S	I	R	L	V	N	G	S	R	A
L	L	L	L	I	V	T	R	I	C	E	L	S	Y	H	R	L	W
D	L	L	L	Y	W	W	N	L	L	Q	Y	W	S	Q	E	L	K
E	S	A	V	N	L	L	N	A	T	A	I	A	V	A	E	*	

FIGURE 54B

[illegible]

**DNA sequence of HIV-1 (strain BH10) Protease (PI, nt 1407-1907) [SEQ ID NO: 56]:**

atgttcttagggaagatctggccttcctacaagggaaggccagggaattttcttcagagcagaccagagcca  
acagccccaccatttcttcagagcagaccagagccaacagccccaccagaagagagcttcaggtctggggt  
agagacaacaactccccctcagaagcaggagccgatagacaagggaactgtatcctttaacttccctcagatc  
actctttggcaacgacccctcgtcacaataaagataggggggcaactaaagggaagctctattagatacagga  
gcagatgatacagtattagaagaaatgagtttgcagggaagatggaaacaaaaaatgatagggggaattgg  
aggttttatcaaagtaagacagtatgatcagatactcatagaaatctgtggacataaagctataggtacagtatt  
agtaggacctacacctgtcaacataattggaagaaatctgttgactcagattggttgcactttaaattttaa

**FIGURE 55B**

**Amino acid sequence of HIV-1 (strain BH10) Protease (PI) [SEQ ID NO: 57]:**

[illegible]

## FIGURE 56A

DNA sequence of HIV-1 (strain BH10) Gag-PI [SEQ ID NO: 58]:

Atggggtgcgagagcgtcagttattaagcgggggagaattagatcgatgggaaaaaattcg  
gttaaggccagggggaaagaaaaaatataaattaaaacatatagtatgggcaagcaggg  
agctagaacgattcgcagttaatcctggcctgttagaaacatcagaaggctgtagacaa  
atactgggacagctacaaccatcccttcagacaggatcagaagaacttagatcattata  
taatacagtagcaaccctctattgtgtgcatcaaaggatagagataaaagacaccaagg  
aagcttttagacaagatagaggaagagcaaaaacaaaagtaagaaaaaagcacagcaagca  
gcagctgacacaggacacagcagtcaggtcagccaaaattaccctatagtgacagaacat  
ccagggggcaaattggtacatcaggccatatcacctagaactttaaatgcatgggtaaaag  
tagtagaagagaaggctttcagcccagaagtaatacccatgttttcagcattatcagaa  
ggagccaccccacaagattttaaacaccatgctaaacacagtggggggacatcaagcagc  
catgcaaattgttaaaagagaccatcaatgaggaagctgcagaatgggatagagtacatc  
cagtgcatgcagggcctattgcaccaggccagatgagagaaccaaggggaagtacata  
gcaggaactactagtacccttcaggaacaaataggatggatgacaaataatccacctat  
cccagtaggagaaaattttataaaagatggataatcctgggattaaataaaaatagtaagaa  
tgtatagccctaccagcattctggacataagacaaggaccaaaagaaccttttagagac  
tatgtagaccggttctataaaaactctaagagccgagcaagcttcacaggaggtaaaaaa  
ttgatgacagaaaccttggttggtccaaaatgcgaaccagattgtaagactattttaa  
aagcattgggaccagcggctacactagaagaaatgatgacagcatgtcagggagtagga  
ggaccggccataaggcaagagttttggctgaagcaatgagccaagtaacaaatacagc  
taccataatgatgcagagaggcaatttttaggaaccaaagaaagatgggttaagtgtttca  
attgtggcaaagaagggcacacagccagaaattgcagggcccctaggaaaaagggctgt  
tggaatgtggaaggaaggacaccaaattgaaagattgtactgagagacaggctaattt  
ctttagggaagatctggccttcctacaagggaaggccagggaattttcttcagagcaga  
ccagagccaacagccccaccattttcttcagagcagaccagagccaacagccccaccaga  
agagagcttcaggtctggggtagagacaacaactccccctcagaagcaggagccgatag  
acaaggaactgtatcctttaacttccctcagatcactctttggcaacgaccctcgta  
caataaagataggggggcaactaaaggaagctctattagatacaggagcagatgataca  
gtattagaagaaatgagtttgccaggaagatggaaacaaaaaatgatagggggaattgg  
aggttttatcaaagtaagacagtatgatcagatactcatagaaatctgtggacataaag  
ctataggtacagtattagtaggacctacacctgtcaacataattggaagaaatctgttg  
actcagattggttgcacttttaatttttaa

## **FIGURE 57**

### **Primers for multi-clade V3 loops:**

Clade A: (1). forward primer A888F5 [SEQ ID NO: 60]:

5'-aaa tca acc gga att gaa ttc cct cgg gtg tac cag acc taa caa caa tac-3'  
EcoRI    Aval

(2). reverse primer A-CR3 [SEQ ID NO: 61]:

5'-att gtt ggg tct cgt aca aca atg tgc ttg tct tat atc ccc-3'

Clade C: (3). forward primer A-CF5 [SEQ ID NO: 62]:

5'-ggg gat ata aga caa gca cat tgt acg aga ccc aac aat ac-3'

(4). reverse primer C980R3 [SEQ ID NO: 63]:

5'-gtt gta ggg cct tgt gca aca atg tgc ttg tct tat atc -3'

Clade D: (5). forward primer D888F5 [SEQ ID NO: 64]:

5'-gat ata aga caa gca cat tgt tgc aca agg ccc tac aac-3'

(6). reverse primer D-ER3 [SEQ ID NO: 65]:

5'-ggt gga ggg tct ggt aca aca atg tgc tct tct tat -3'

Clade E: (7). forward primer D-EF5 [SEQ ID NO: 66]:

5' -ata aga aga gca cat tgt tgt acc aga ccc tcc acc-3'

(8). reverse primer E998R3 [SEQ ID NO: 67]:

5'-gta ttg ttg ttg ggt ctt gta caa caa tat gct ttt ctt ata tct cc-3'

Clade F: (9). forward primer F888F5 [SEQ ID NO: 68]:

5'-gga gat ata aga aaa gca tat tgt tgt aca aga ccc aac aac aat ac-3'

(10). reverse primer F-GR3 [SEQ ID NO: 69]:

5'-gtt att agg tct ggt aca aca atg tgc ctt tct gat gtc-3'

Clade G: (11). forward primer F-GF5 [SEQ ID NO: 70]:

5'-gac atc aga aag gca cat tgt tgt acc aga cct aat aac-3'

(12). reverse primer G989R3 [SEQ ID NO: 71]:

5'-aat aaa cta gtc tag acc ccc gag tct aga aca atg tgc ttg tct tat atc tcc-3'  
Aval    XbaI